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RESEARCH REPORT

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by

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1.0 INTRODUCTION

1.1 Statement of the Problem

The Medicare-Medicaid legislation passed by Congress in 1965 had as a principal goal the incorporation of the elderly and the poor into "mainstream" medicine. This included improved access to private ambulatory care on a personal, continuous basis. Yet, since the inception of the two programs, each has been marred by limited physician participation and alleged fraud and abuse by providers. These two problems are related, as areas with a high degree of nonparticipation leave the poor to be treated by a small number of physicians. Policymakers have been concerned that these latter practices, physicians with disproportionately high Medicaid caseloads, may be "mills" in which low quality care is provided.

Previous work has shown, however, that physicians with large Medicaid practices (LMPs) treat the majority of _all_ Medicaid patients seen in private offices. If federal regulations prohibit or discourage these LMPs, then who will care for the Medicaid poor? Policymakers must weigh the quality of physician services under Medicaid with access to care; is some care better than no care (or institutional care)? Before attempting to answer this question, we need to know why some physicians choose not to participate in the first place and why others choose to see large numbers of Medicaid patients. What policy levers can be used to influence the participation decision? What are the credentials and _modus operandi_ of these LMP physicians? Is the Medicaid market a lucrative one, or are these physicians penalized for treating the poor? In this report, we examine all of these questions and more (including similar issues in the area of Medicare assignment).

1.1.1 Physician Participation in Medicaid

Most empirical research on physician willingness to participate in state Medicaid programs has been based on individual state programs. Physicians surveyed in those states consistently cite low fees, payment delays, disallowances, and excessive paperwork as reasons for their nonparticipation (Garner _et al._, 1979; Jones and Hamburger, 1976). Since Medicaid fees and collection costs generally are uniform on a state basis but vary substantially across states, these studies cannot measure the marginal effects on physician

participation due to shifts in these variables. One single state (California) study, however, did find that participation rates varied positively with average revenue per Medicaid patient, where the unit of analysis was the county rather than the physician (Hadley, 1979).

Two multi-state studies have been conducted of physician participation in state Medicaid programs. Sloan, Cromwell, and Mitchell (1978) derived direct estimates of the effects of fee schedules, collection ease, demand variables, practice costs and physicians' political attitudes on participation decisions, using a national sample of physicians from the five primary care specialties. The average Medicaid participation rate was 10 percent with 23 percent of physicians treating no Medicaid patients. The degree of physician involvement in Medicaid was found to be very sensitive to Medicaid reimbursement levels; a ten percent increase in the Medicaid fee schedule raised participation rates by seven percent on average. Physicians were less likely to see Medicaid patients when the "red-tape" associated with obtaining payment was greater. The authors' empirical results also suggest competition between programs for physician time through reimbursement; higher Blue Shield fees lowered participation rates.

Davidson and Perloff (1980) examined Medicaid participation for pediatricians in 13 states. Their results were generally consistent with those of Sloan, Cromwell, Mitchell. Pediatricians were more likely to participate (and to participate more fully) when Medicaid payments were higher and when states were more generous in scope of services offered.

These multivariate studies have all focussed on five or less of the primary care specialties: general/family practice, general surgery, internal medicine, obstetrics-gynecology, and pediatrics. No behavioral analyses have been conducted to examine the factors influencing the Medicaid participation decision for other physicians, e.g. medical and surgical specialists, psychiatrists. We study these specialists' willingness to accept Medicaid patients in detail.

1.1.2 Large Medicaid Practices

The Moss investigations (U.S. Senate Special Committee on Aging, 1976) spotlighted the problem of Medicaid provider fraud and abuse and, if not responsible for coining the phrase, certainly popularized the term "Medicaid mills". Based on incognito visits in a few large cities, Senator Moss and his

staff found the Medicaid-dominated facilities to be generally unsanitary, unresponsive to patients, and riddled with unnecessary ancillary services and illegal kickbacks. They characterized these practices as high-volume, assembly-line operations run by well paid, but poorly trained, physicians. As a result of these and other investigations (see Bellin and Kavaler, 1971; Bloom *et al.*, 1968; U.S. Senate Committee on Finance, 1970), large Medicaid practices and Medicaid mills have generally been considered synonomous, rendering LMPs automatically suspect in the eyes of many public officials. Based on national survey data, however, Mitchell and Cromwell (1980) found no evidence that mills are a major factor in LMPs generally. Visit lengths were shorter in these LMPs, but only by a minute or two. Nor was there any widespread abuse of ancillary services, skimping on auxiliary personnel, or excessive markups over costs. LMP physicians at best averaged what other physicians make; usually earnings were less. A serious credentials gap did appear to exist, however, between these physicians and those operating smaller Medicaid practices. LMP physicians tended to be older, less specialized, foreign medical graduates and were less likely to be board-certified.

This analysis of large Medicaid practices was limited in scope largely due to small sample sizes in certain cells. This was particularly a problem for many specialty-specific analyses. Yet decomposition by specialty is a critical first adjustment for case-mix differences. By merging two survey years worth of data, we double our sample size and are able to conduct our analysis of physician credentials and *modus operandi* by specialty.

1.1.3 Medicare Assignment

The physician's decision to take Medicare assignment is basically similar to his decision to treat Medicaid patients. Although several studies have analyzed variation in assignment rates at the carrier level (Huang and Koropecky, 1973; Institute of Medicine, 1976; Muller and Otelsberg, 1979), only two have employed the physician as the unit of analysis. In order to evaluate the differential impact of policy tools, Paringer (1980) estimated assignment equations separately for northern California physicians who participated in Medicaid and those who did not. High Medicare prevailings had a positive impact on assignment, but were significant only for nonparticipants in Medicaid. Based on a national survey of physicians, Mitchell and Cromwell (1981)

found that assignment rates were very sensitive to reimbursement and administrative practices under Medicare. A ten percent increase in the prevailing charge, for example, raised assignment by 14.7 percent. Higher carrier rates of reduction and higher claims denial and investigation rates significantly depressed assignment. Despite the similarities between Medicaid and Medicare assignment, no studies have analyzed the physician's joint decision to participate in both public programs.

There has been growing discussion in policy circles of making Medicare assignment even more like the Medicaid program by eliminating the case by case assignment option, i.e., an "all or nothing" requirement. Would this result in a two-tiered form of medicine under Medicare, similar to what already exists under Medicaid? We explore these and related issues in the chapters that follow.

1.2 Summary of Findings

In this section we provide a brief summary of our principal findings. The reader is referred to the body of the report for detailed findings corroborating the general discussion below.

As presently legislated, both the Medicare Part B and Medicaid programs have certain features that promote unequal access and physician inequities in the treatment of the elderly and the poor -- particularly for primary physician care. By law, Medicare payments to physicians can be no higher than those allowed by other third parties, and Medicaid payments, in turn, must be no greater than Medicare rates. The practical result is a fee hierarchy with public program rates as much as fifty percent below usual physician charges. Furthermore, Medicare and Medicaid reimbursement can involve extensive payment delays, prior authorization, limited coverage, and outright administrative denials of submitted claims, all of which raise the billing/collection cost to physicians of accepting Medicare patients on assignment or treating Medicaid eligibles.

Congressional insistence upon lower reimbursement for public beneficiaries and extensive utilization limits derived from a natural concern over abuse of the programs by patients and physicians alike. An unfortunate by-product of these rules and regulations has been the creation of an unattractive secondary

market for physician labor, one in which remuneration is lower and the hassles of collecting payment greater. The majority of physicians, however, are in great demand with several lucrative sources competing for their time, and average physician incomes are so high now that work effort may even fall off with higher fees, making Medicare/Medicaid competition for their services even more acute.

1.2.1 Medicare/Medicaid as a Secondary Market

A principal outcome of this competition is the relegation of public program beneficiaries to less qualified primary care physicians who are otherwise unable to compete (or occasionally refuse to) in the main physician market. Primary care physicians devoting very large percentages of their practices to Medicare and Medicaid patients, while only 6 percent of all physicians, see 27 percent of all patients admitted to a private physician's office. The fact that they are much less often board certified or trained in U.S. medical schools is indicative of the secondary status generally accorded this market by other "mainstream" physicians. Black and female physicians also are found in disproportionate numbers in this market (3 to 100 times more), and although this is in no way indicative of substandard care, it does reflect in yet another way the dissatisfaction most white male physicians feel with the public programs. A notable exception to this finding is the lack of quality differences among secondary medical and surgical specialists who do and do not see large numbers of Medicaid patients. Only ophthalmologists and urologists were less board certified with no real difference in FMG status, hospital affiliation, or other credentials.

Physicians serving the poor and the elderly make decent incomes to be sure (average $58,000), but in marked contrast to public perceptions, they are generally earning significantly less than their colleagues eschewing public participation. This is true even after adjusting for work effort, training, credentials, and cost of living. Even the secondary specialists with large Medicaid practices are unable to completely offset the low Medicaid fees with more lucrative private patients. Those with large Medicare caseloads do somewhat better than those concentrating on Medicaid alone, but still fail to keep up with small program participants. Thus, a closer investigation

of very large joint Medicare/Medicaid caseloads again shows no evidence of widespread fortunes being made off either program.

There is, however, a special group of High Income Large Medicaid Practice (HILMP) physicians who are doing quite well even though they receive much lower Medicaid fees for a substantial part of their caseload. One-in-six LMP physicians, in fact, earned over $80,000 (in 1977 dollars) even though their Medicaid participation was 2-3 times above the national average. Unlike LMP physicians in general, who have typical volume, work effort, visit lengths, and ancillary use, HILMP physicians have (a) 20-25 percent greater volume with no additional hours, resulting in significantly shorter visit lengths (15 vs. 20 minutes), (b) a more complex, expensive visit mix, and (c) much heavier ancillary use. Part of this is simply attributable to their specialization, as only one-in-five are GPs, but lengths-of-visits, visit mix, and ancillary use are all different even holding specialty constant. According to our estimates, slightly less than half of their higher incomes is explained by greater "productivity," or visits per physician hour, while the rest is essentially due to higher average markups. A more complicated visit mix appears to more or less offset the effect of lower Medicaid fees, leaving the rest of the difference in markups (about 25%) to be explained by greater ancillary intensity.

Most public program physicians are not like these physicians, however. They run primarily solo, unincorporated practices with GPs dominant in the Northeast and general surgeons, internists, obstetricians-gynecologists, and pediatricians more prevalent in the South and West. Practically the only way in which they differ is their more extensive use of clerical personnel--a difference that is even more dramatic among high income LMP physicians. This is presumably in response to the extra burden associated with government reimbursement, and reflects adaptive behavior on their part in order to minimize public payment losses.

1.2.2 The Influence of Programmatic Factors on Participation

Multivariate statistical analysis again confirmed the quantitative importance of programmatic characteristics on physician entry and level of participation in the two public programs.

(1) A ten percent increase in either the Medicare prevailing charge or the Medicaid fee raises participation nearly four percent while higher Blue Shield fees definitely reduce participation. Insurer fee competition clearly works to the detriment of Medicare/Medicaid, with physicians, as opposed to patients, receiving most of the benefits of higher fees.

(2) Higher investigation and denial rates for Medicare claims also lower physician participation rates.

(3) The use of an outside fiscal agent to process Medicaid claims encourages greater participation by reducing payment delays. State Medicaid programs with such an arrangement experience physician participation rates as much as 8 percentage points higher than states who process their own claims. This is true even holding fee levels and other confounding factors constant.

(4) Imposition of utilization limits and prior authorization for payment also lowers participation, especially for secondary specialists.

(5) Medicare assignment and Medicaid participation are also dramatically higher (5-7 percentage points) in states offering the medically indigent option; broader AFDC/SSI eligibility has a similar impact.

(6) In marked contrast to Medicaid eligibility effects, which are decidedly positive, locales dominated by the elderly experience less joint participation by physicians. This we attribute to the case-by-case option under Medicare which allows the physician to selectively choose which patients (or even claims) he will take on assignment. Where elderly demand per physician is greater, there is less need to accept the lower Medicare fees as payment-in-full.

Most of these programmatic findings, while not particularly surprising, are nonetheless confirmation of the importance of program administration and policies on beneficiary access to less expensive ambulatory care, as well as the inequities that arise among physicians in serving the two public markets. If federal policy in the future will allow states even greater discretion in setting reimbursements, limits, and denying payment, then two unambiguous outcomes will be (1) a more segregated patient market, and (2) even greater financial penalties for those physicians willing (or competitively forced) to treat large numbers of the poor or elderly. This is true unless other programmatic changes take place that encourage more voluntary participation. An example of one such change might be the elimination of the Medicare case-by-case option. The results of our analysis of this key programmatic change are presented next.

1.2.3 "All or Nothing" Assignment Requirement Under Medicare

In an effort to raise assignment rates, some policymakers have considered introducing an "all or nothing" assignment requirement to the Medicare program. The case-by-case option would be dropped, and physicians would have to decide whether to accept all of their Medicare patients on assignment, or none of them. Others have worried, however, that physicians might desert the program in droves, leaving only less qualified practitioners to treat assigned patients.

Over two-thirds of physicians surveyed in fact responded that they would take none of their patients on assignment if forced to choose. While a two tier system would not necessarily emerge, our simulations show that introducing an all or nothing requirement would actually have the opposite effect from what was intended: assignment rates nationwide would fall almost 10 percent. The total supply of assigned visits would also decline, by almost 6 percent. While this percent reduction may seem fairly small, the absolute number of visits (and patients) affected is quite large: approximately 5.4 million assigned visits lost per year. For every previously assigned visit the physician now declines to accept, the out-of-pocket liability to the patient is increased by some (indeterminate) amount.

The single most important factor influencing the "all or none" decision was the physician's current assignment rate. The higher the physician's assigned caseload to start with, the more likely he was to choose the "all" option. Thus, policy levers encouraging assignment, such as higher Medicare fees and lower rates of reduction, would also lead more physicians to choose the "all" option. It does not appear that two levels of medical care would be created as has happened in the Medicaid program, however, as there were no differences in credentials between physicians choosing either the "all" or the "none" options. Nevertheless, access to some specialist services may be limited for assigned patients; only one out of every five internists stated they would take all patients on assignment compared with two out of five general surgeons and OB-GYNs. This is of particular concern since internists are a major source of care for Medicare patients, second only to GPs.

For policy purposes, we also want to know whether certain types of services or parts of the country would be affected more than others. The mean supply of assigned visits actually would increase 11 percent for general practitioners,

while decreasing 12-25 percent for all other specialties. Thus, access to specialized medical and surgical services would be reduced considerably for assigned patients. In part because of such differences in specialty mix, assigned patients in nonmetropolitan areas and in the West would be better off, as the supply of assigned visits would increase in these areas following the introduction of an "all or nothing" requirement.

Based on our simulations, dropping the case by case option of Medicare assignment would not achieve the desired policy results. So long as nonassigned elderly demand remains buoyed up by continued government payment (albeit indirect), the majority of physicians will eschew the "all" option. An alternative, and more rigorous version of the "all or nothing" requirement could take advantage of the government's monopsonistic purchasing power to induce more physicians to accept assignment. In this Medicaid-type option, the physician would have to take assignment or forego any government reimbursement for his services, either directly or indirectly as patients would not be able to collect directly from Medicare. Few physicians could probably afford to give up the Medicare subsidy totally, despite threatened defections from the program.

1.3 Overview of Report

Chapter 2 provides a theoretical framework for all of the analyses described in later chapters. The two-market demand model is analyzed and extended to include the physician's joint decision to accept Medicare patients on assignment and to treat Medicaid patients. The physician surveys and other data used to support the analyses are described in Chapter 3.

Chapter 4 includes two independent, but related, analyses of primary care physicians. First, we examine physicians with extra-large Medicaid practices, and compare them with physicians who run smaller Medicaid practices. Areas of comparison include credentials, incomes, work effort, costs and markups, inputs, and geographic location. Second, we conduct similar analyses of physicians who participate extensively in both public programs: Medicaid and Medicare assignment. Chapter 5 also examines physicians with large Medicaid practices, but here we examine the secondary specialties: medical and surgical specialists, and psychiatrists.

In Chapter 6, we focus on an unusual group: large Medicaid practice physicians with high incomes. These physicians are unusual because the low Medicaid fees received for many of their patients should depress net earnings relative to other physicians. High income LMPs are compared to other large Medicaid practices and to high income small Medicaid practices.

Chapter 7 presents three independent sets of econometric analyses of physician participation in public programs. First, we examine the Medicaid participation decision for nine medical and surgical specialties. These regressions provide the first national estimates of the impact of policy variables on specialists' willingness to treat Medicaid patients. Similar analyses are then presented for psychiatrists. Third, we analyze the physician's joint decision to participate in Medicaid and to take Medicare patients on assignment.

In Chapter 8, we examine the impact of eliminating the case-by-case assignment option under Medicare and substituting an "all or nothing" requirement. Physicians were asked, if they had to choose between accepting all of their Medicare patients on assignment or none of them, which would they choose. Chapter 8 describes the characteristics of physicians choosing all vs. none and provides estimates of the net change in assignment rates and assigned visits.

Finally, Chapter 9 presents descriptive findings on the characteristics, earnings, and practice patterns of black physicians. In particular, we compare public program participation between black and white physicians.

2.0 THEORY OF MEDICAID AND MEDICARE PARTICIPATION

This chapter provides a theoretical paradigm, first, for the physician's decision to participate in the Medicaid program, then for the more general decision to jointly treat Medicaid patients and take Medicare patients on assignment.

2.1 Medicaid Participation

2.1.1 The Two-Market Demand Model

The physician's decision to see Medicaid patients can be considered in terms of a two-market demand model.* In one market, the physician is a price-setter; demand is downward-sloping and additional visits are demanded only at lower prices. In the second market, fees are predetermined and the physician serving this market can provide as much as he chooses, within limits, at a fixed price. While several insurors have fixed payment schedules, we consider only the fixed payment Medicaid program here.

Assuming profit maximization (to be relaxed momentarily) for each visit level, the physician moves down along his marginal revenue curve, AB, in Figure 2-1 until marginal revenue falls below the fixed Medicaid fee, f_m.** The physician would then begin to participate in the Medicaid program until the pool of Medicaid patients were exhausted.*** Demand segment, BC, corresponds to the potential pool of Medicaid patients upon which each physician may draw. The introduction of Medicaid effectively segments marginal revenue into two parts, one above, one below, the Medicaid fee, f_m. Marginal patients in the upper segment, AB, are willing and able to pay higher fees than f_m, while in segment CD, they will only pay less than f_m.

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*A more complete exposition of the two-market demand model, including a comparative statics analysis of changes in exogenous demand on supply variables, can be found in Sloan, Mitchell, Cromwell (1978).

**For a monopolist facing a downward sloping demand curve, marginal revenue would be below the demand curve. If the physician were a perfect price discriminator, however, marginal revenue and demand curves would coincide. The relevant marginal revenue curve, therefore, will be closer to the demand curve the more the physician price discriminates.

***While the total Medicaid pool would more than fill the caseload of any individual physician, limited access implies a finite potential pool that a physician could realistically serve. This may or may not exhaust the rest of his patient contact hours.

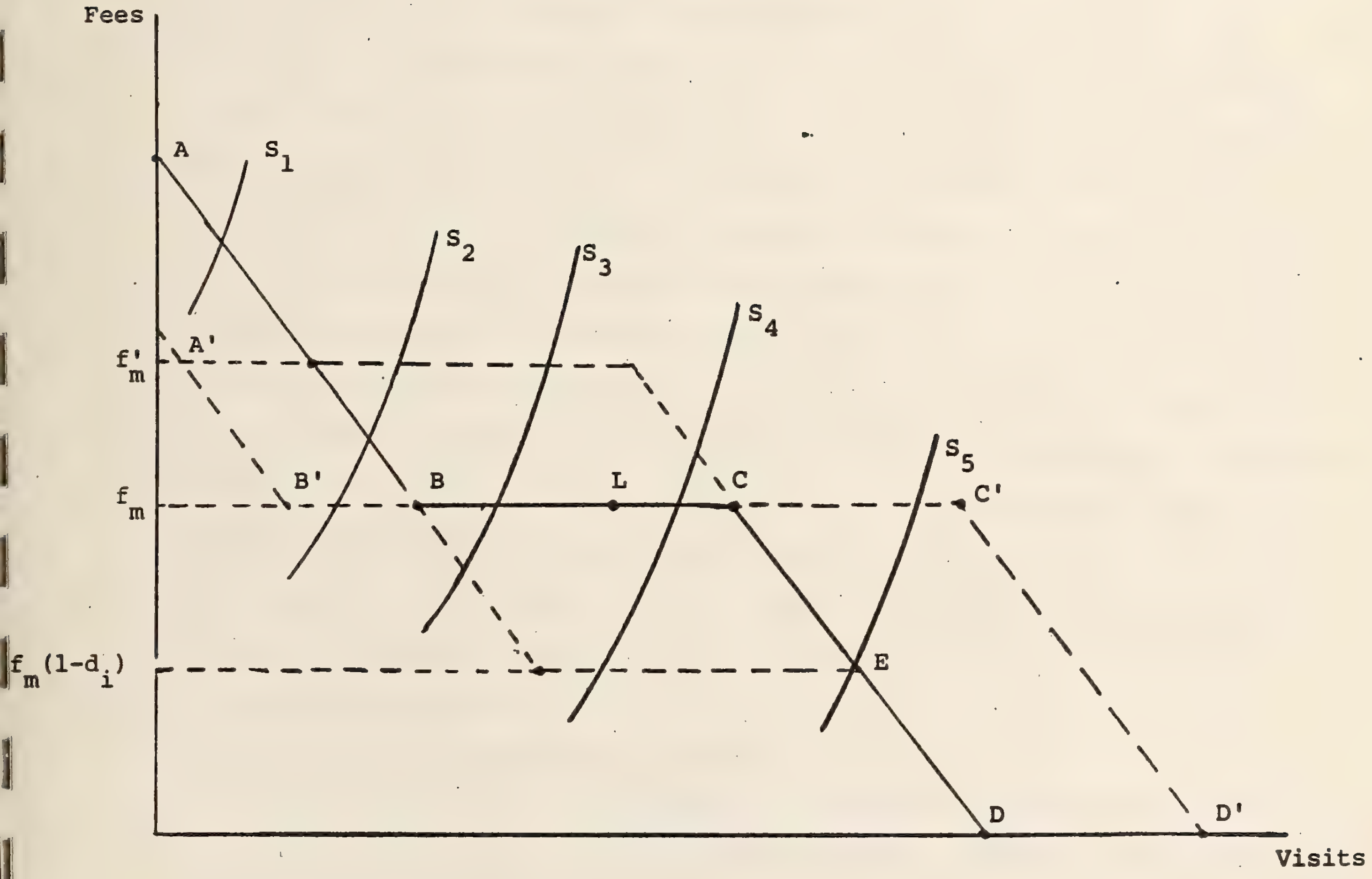

FIGURE 2-1: MEDICAID PARTICIPATION MODEL

If a physician's supply curve were S_3 he could be said to be operating a small Medicaid practice (SMP) as the majority of his visits are with private patients. (A more precise definition of an SMP will be given later.) If physician supply were further to the right, say S_4, then this practice could be considered an LMP, as a majority of patient visits are devoted to Medicaid patients. If supply were far to the left, say S_1, then the physician would not be accepting any Medicaid patients.

Thus, the physician's decision to participate in Medicaid, as well as the level of his participation, will depend on supply and private-plus-Medicaid demand. Private physician demand can be considered a function of (a) patient health status, (b) income, (c) insurance, (d) physician credentials, and (e) competition. Considerable empirical research has documented the effects of health status, income, and insurance on private demand (Feldstein, 1970; Newhouse and Phelps, 1976). Patients should also be willing to pay higher fees to see better trained specialists. Holding these factors constant, private demand per physician should be lower in physician-rich areas because of competition, with limited numbers of patients spread among a larger number of physicians.* Factors limiting private demand shift marginal revenue inward (see A'B', in Figure 2-1), increasing the Medicaid participation rate for a given physician, *ceteris paribus*. Reduced demand would also draw into the program marginal nonparticpants (represented by supply S_2).

2.1.2 Medicaid Coverage and Generosity

Medicaid coverage and generosity of payment will definitely affect the level and nature of physician participation. Consider first an increase in Medicaid fees from f_m to f'_m without a change in program eligibility. If physician supply were S_2, an increase in fees to f'_m would draw the physician into the Medicaid market as an SMP. If supply were S_3, the effect

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*This assumes no demand inducement. If physicians can protect themselves against competition by arbitrarily shifting private demand, then more physicians in an area would not necessarily lead to fewer private visits per physician and the corollary, more Medicaid visits. Perceived disadvantages to serving Medicaid patients (e.g., payment delays, discrimination), may actually encourage some physicians to induce private demand rather than enter the public market.

of a Medicaid fee increase could be to turn an SMP into an LMP. Note that while total visits have increased with higher Medicaid fees, private visits have generally decreased, implying some substitution of poorer Medicaid for wealthier (or previously better insured) patients at the margin. Physicians with supply S_1 and S_5 would be unaffected by the fee increase; the former still does not see any Medicaid patients while the latter sees all that ask for an appointment.

The net effect of Medicaid fees on the probability distribution of SMPs and LMPs in an area is generally ambiguous. Higher Medicaid fees do not necessarily foster LMPs (at least as a percent of participants), if significant numbers of new physicians (like S_2) enter the Medicaid market as SMPs.

An increase in program eligibility or scope of benefits should have different effects. Increasing the Medicaid-eligible pool per physician has the effect of "lengthening" the Medicaid line from BC to BC'. This should have no effect on nonparticipating physicians: Medicaid fees have not increased, so marginal revenues from private patients still exceed the Medicaid fee.* Nor would it have any effect on participating practices that have not exhausted their potential pool of eligibles, again for the same reasons. Some practices, however, may be seeing all the Medicaid patients who apply and some non-Medicaid poor in addition, e.g., S_5. An extension of Medicaid coverage would have a positive effect on participation (as well as on total visits) as these physicians substitute better paying Medicaid for poorer paying private patients. If Medicaid coverage were extended for poor patients already included in the physician's caseload, say, CE, then no substantial improvement in access would result (unless S_5 were quite elastic), but only a reduced out-of-pocket burden for the new eligibles. If coverage were extended to patients in segment ED, however, then the near poor comprising CE would suffer as a result of expanded Medicaid coverage to the very poor.

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*According to the 1975 HCFA physician survey, 77 percent of nonparticipants did not feel the absence of Medicaid eligibles explained their nonparticipation. Other factors like low fee schedules were emphasized. See Sloan, Cromwell, Mitchell (1978, p. 122).

A practice characterized by S_5 highlights an interesting point. A physician may be seeing all the Medicaid patients that apply, but because the eligible population is so limited (at least before the program expanded), his practice may still be an SMP. Furthermore, the length of the horizontal line, which is based on the Medicaid population, is clearly related to private demand factors such as income. For this reason, we would expect both participation rates and the number of LMPs to be higher in poorer neighborhoods, inner cities, and rural areas. This may be offset, on the other hand, by a shortage of physicians in these areas which would shift out *pro rata* private demand and reduce Medicaid participation. Thus we have the rather surprising conclusion that the number of both nonparticipants and LMPs in a low-income, high Medicaid area may be higher than elsewhere if physicians are particularly scarce -- as they generally are in these areas.

Summarizing on the demand side, theory predicts that any factor raising (lowering) private demand per physician (e.g., income, insurance, health status, credentials and specialization, the physician-population ratio) should decrease (increase) the probability of participation as an SMP and of the participating practice expanding to an LMP, *ceteris paribus*. Similar predictions obtain for an increase in Medicaid fees. Whether higher Medicaid fees would exacerbate the distribution of patients between SMPs and LMPs becomes strictly an empirical question. Extensions in program eligibility, by contrast, should have definite effects on the size distribution of Medicaid practices, essentially skewing the distribution towards more LMPs.

2.1.3 Discrimination

The analysis so far has implicitly assumed physicians do not discriminate among patients on factors other than ability to pay. Some physicians however, may have a distaste for Medicaid patients or the program as a whole. Some of their reasons may be objective (e.g., fee schedules too low, long payment delays, too much red tape, few Medicaid eligibles), others more personal. In the 1975 physician survey, nearly 40 percent of nonparticipants cited an "opposition to government in medicine" as a very important reason for not participaing in the Medicaid program. Twenty-five percent also cited a "dislike for the kinds of patients enrolled" as a reason for not participating

(Sloan, Cromwell, Mitchell, 1978, p. 122). Subjective responses like these strongly suggest that physicians discriminate against Medicaid patients for other than economic reasons.

Faced with a stated Medicaid fee, f_m, some physicians act as if $f_m(1-d_i)$ were the net fee, where d_i reflects the strength of the i-th physician's discrimination coefficient à la Becker (1957).* This has the effect of lowering the flat Medicaid portion by an amount, $f_m d_i$, which will clearly vary by individual physician, unlike f_m which all physicians receive as a nominal payment.** The effect of discrimination will be to lower participation and physician gross revenues, but not always. For example, it is immaterial whether physician with supply S_1 is a discriminator or not, for he would not participate in Medicaid in any event. For physicians with supply S_3 or S_4, however, discrimination does make a difference. The "potential" SMP physician with supply S_3, if he had a positive discrimination coefficient, d_i, would not participate in Medicaid, even though he ought to on objective financial grounds. The "potential" LMP physician with supply S_4 would only be an SMP, choosing instead to move further down his private demand curve before (begrudgingly) entering the program.

Discrimination in this context would cost the physician because he chooses to see poorer paying private patients at the margin rather than better paying Medicaid patients. Economic losses to physician naturally increase with d_i.*** In the extreme where $d_i > f_m$, the physician would limit himself strictly to non-Medicaid patients no matter his objective supply. For these physicians the economic loss could be a high price to pay for refusing to accept Medicaid patients, particularly if private demand were

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*While d_i is usually defined in terms of subjective preferences, real physician costs associated with the Medicaid program which lower net returns (e.g., complicated forms, payment delays) are comingled with preferences and are very difficult to disentangle.

**Actually all physicians would receive f_m if no specialty or physician-specific differences in allowable fees existed. Medicaid programs do make specialty distinctions. In addition, many use UCR reimbursement techniques based on individual physician profiles.

***For a mathematical treatment of losses due to discrimination in the context of employer discrimination, see Thurow (1969, p.115).

limited. This does not necessarily mean that the physician is not seeing poor patients. On the contrary, he may be seeing many of the poor. He is just not receiving directly from them as much as he could if he had chosen to accept them as Medicaid patients.

The size distribution of Medicaid practices will vary depending on the mean and variation in d_i. Holding other factors like private demand and the distribution of practices constant, an inverse correlation between discriminatory preferences and supply (i.e., smaller suppliers with a greater distaste for the Medicaid program) should result in greater inequalities in Medicaid practice size. In this case, there should be more nonparticipants and fewer SMPs, leaving the bulk of the Medicaid population to be served by a few LMPs. A greater average level of discrimination in an area, like Medicaid fees, has an ambiguous effect on SMP/LMP inequalities, while a positive correlation between discriminatory preferences and private demand would reinforce both as discriminators enjoy a more lucrative private practice, leaving nondiscriminators lacking wealthy private patients to treat the Medicaid population.

2.1.4 Variations in Physician Supply

The ultimate impact of any shift in private or Medicaid demand on Medicaid participation rates in an area will depend on the locus and distribution of supply. Medicaid patients constitute 10-15 percent of all private physicians' caseloads nationwide. If Medicaid patients and physicians were distributed equally across the general population, then participation rates should approximate 10-15 percent in any community. Because neither is very equally distributed, it is possible for all physicians in an area to be operating LMPs if few non-Medicaid patients exist. They would not have to be; need may simply go unmet as physicians choose to see a limited number *in toto*.

If the distribution of supply curves were uniformly distributed along the entire "visits" axis as shown (roughly) in Figure 2-1, then a complete mix of nonparticipants, SMPs, and LMPs would obtain. Shifts in demand would alter the mix, with increases in private demand (or reductions in Medicaid fees) resulting in more nonparticipants, fewer LMPs, and more or less SMPs depending upon the distribution of practices around the "drop-out" kink (B) and some designated point L, the point where an SMP becomes

an LMP.* If practices are more closesly bunched around B than L, then increases in private demand or Medicaid fee reductions should reduce the relative number of SMPs to LMPs and exacerbate inequalities in the distribution of Medicaid patients across physicians.

The locus and distribution of area supply will depend on the mean of, and the variance in, the characteristics that underly individual physician supply: input prices; productivity; physician preferences for income and leisure; and practice style. In areas where auxiliary wages are high, or where average productivity is low, total physician supply will be lower as physicians are financially limited in the visits they can provide profitably for a given fee. Specialists, for example, see fewer patients per hour. Therefore, in specialist-dominated areas, we would expect more limited supply and lower participation rates, *ceteris paribus*. If physicians in an area also have a higher average preference for leisure (e.g., older, semi-retired physicians in Florida or Arizona), supply would be less than in areas where work (or income) preferences were stronger. Finally, in areas served by physicians whose practice style included a significant number of high quality inputs, amenities, and the like, supply would also be lower as fees would cover only a limited number of more costly visits before marginal costs exceeded marginal revenues.

Variations in physician supply would be a function of variations in the same four categories. Presumably all practices in an area would face the same non-physician input prices although certain exceptions may exist (e.g., black physicians may have to pay higher wages to attract white RNs to inner cities); thus, within-area variations in factor prices should not be a major contributor to supply differences or to the number of LMPs, although they may explain more of the *inter-area* variation.

Variations in physician productivity are considerable, however, as Reinhardt (1975) has shown. Much of this variation tends to be specialty-specific. What output variation remains would depend to a large extent on the physician's managerial capacities and inclinations.

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*This point is clearly arbitrary. In the empirical work that follows, point L (where an SMP becomes an LMP) is defined as one standard deviation above the specialty-specific mean rate of Medicaid participation.

Physicians also vary considerably in the imputed wage they apply to their own efforts or, alternatively, their preferences for leisure. In addition to random variations in income-leisure preferences, physicians with significant non-practice income, or who are elderly, or female physicians who have children they are responsible for raising, should have a greater disutility for work, ceteris paribus (Sloan, 1974; 1975; Sloan, Mitchell, Cromwell, 1978).

Finally, and most important from a policy perspective, physicians vary in their choice of practice style, partly out of training and specialty choice, partly out of a desire to increase incomes. Variations in practice style include the time physicians spend with patients, the ancillaries they order, the quantity and quality of labor inputs used, the size of waiting rooms, and the like.

Consider first the use of ancillary services, such as laboratory tests and x-rays. As they are usually billed separately, it is appropriate to consider ancillaries a second output of the physician's practice, complementing direct patient contacts. Physicians may or may not internalize ancillary services.* If they do not, then no financial benefit would derive from ordering tests and procedures unless illicit kickbacks were being paid. Where physicians do produce ancillaries in their offices, they have a direct financial interest in the allowed charges of third party payors and in production costs. For each visit, physicians would receive two fees, one for the visit itself plus a second for any ancillaries, resulting in a total visit price. The effect of internalizing ancillaries is to shift final visit demand outwards, resulting in more private visits being provided (assuming positively sloped supply curves). The marginal physician internalizing ancillaries would have less of a need or desire to enter the Medicaid market as marginal revenues per private visit are higher. Physicians with very strong income preferences, however, may feel freer to order additional tests for their Medicaid patients who incur no out-of-pocket costs, a behavior typifying the so-called "Medicaid mills" (Moss, 1979). For these physicians, the decision to internalize ancillaries and see large numbers of Medicaid patients would be jointly determined.

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*For reasons why they might or might not, including such variables as practice size and specialty, see Ernst (1976).

Other differences in practice style like time spent with patients, use of support personnel, and amenities, can be characterized as supply shifts. Physicians who see patients on an assembly-line basis, and who skimp on needed auxiliary personnel, can certainly see more patients per hour at lower incurred costs. The higher net incomes enjoyed, however, come primarily at the patients' expense and would not be condoned by the majority of medical professionals. It is difficult in practice, however, to discriminate between the true quality minimizer and the more efficient practitioner.

2.2 Joint Medicare-Medicaid Participation

In the present study, we are also concerned with physicians who treat Medicare patients. Not only does Medicare compete with Medicaid for scarce physician time, but the characteristics of physicians practicing in both markets simultaneously may be demonstrably different from those seeing Medicare patients alone. (Only a very few specialists like pediatricians would see Medicaid but no Medicare patients, for obvious casemix reasons.)

In effect, we have four* types of patients: private, non-assigned and assigned Medicare, and non-elderly Medicaid patients. The physician's decision to participate in Medicaid and his decision to take Medicare patients on assignment are similar. In both instances, the physicians agrees to accept the allowed charge as payment-in-full. Unlike Medicaid, however, Medicare has cost-sharing features so that even under assignment the physician may collect amounts corresponding to the deductible as well as a fraction (20%) of the prevailing charge not paid by Medicare. A second, more important, difference is the ability of physicians to accept assignment on a case by case basis, with non-assigned patients collecting the 80 percent of the allowed charge directly from Medicare.

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*We could also distinguish the joint Medicare-Medicaid patient, as the physician must accept assignment for this patient or not treat him at all. The physician is reimbursed the full Medicare prevailing charge for this patient, and not the lower Medicaid fee, however; thus we have chosen to consider all assigned patients together in order to simplify the graphical presentation.

Consider Figure 2-2. Line ABCD reflects the same marginal revenue curve depicted in Figure 2-1. With the introduction of the Medicare program, physician marginal revenue (and demand) are shifted out to EFGHIJ, and another kink is included at the Medicare allowable charge, R. Because non-assigned Medicare patients can collect eighty percent of the physician's allowable charge from Medicare, the downward sloping private demand curve, AB, is shifted up by an amount equal to .8R (equal to the difference between E and A), as Medicare eligibles are now willing to pay .8R more than without Medicare. The Medicare allowable is higher than the Medicaid allowable, f_m, as required by federal law.

In the private and Medicare non-assigned markets, demand is represented by the downward sloping segment, EF, and additional visits are demanded only at a lower price. In the public markets, the physician can supply as much as he chooses (within limits) for a fixed price. Demand segment, FG, corresponds to the potential pool of assigned Medicare patients he can draw upon,* and HI(=BC) the potential pool of Medicaid patients. Again assuming revenue maximization for each visit level, the physician will move down along his marginal revenue curve, EF, until marginal revenue falls below the Medicare prevailing charge, R. The physician would then begin to accept Medicare patients on assignment. The physician will not enter the (non-elderly) Medicaid market until he has exhausted demand for Medicare assigned services, and marginal revenue falls below the Medicaid fee schedule, f_m.**

The presence of a Medicare insurance program has obvious implications for Medicaid eligibles and physician program participation, depending on the relative payment generosity of Medicare and physician supply. The physician with supply S_2 in Figure 2-2 would be a Medicaid participant in the absence of Medicare, but would not see any Medicaid patients (and only take a limited number of Medicare patients on assignment) once Medicare is introduced. The same is true of physicians with supply S_3, who goes from seeing as many Medicaid patients as apply to none. The physician with

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*At some level of Medicare assigned demand (near point G), demand again turns downward as the very poor elderly are unable to pay even the 20% coinsurance. This phenomenon is discussed in more detail in Chapter 8. See also Mitchell and Cromwell (1981).

**In states which use Medicare UCR reimbursement methods to determine Medicaid fees, the Medicare and Medicaid allowables may be equal (or nearly so) and no second kink emerges. In these case Medicaid patients compete with Medicare patients on factors other than price.

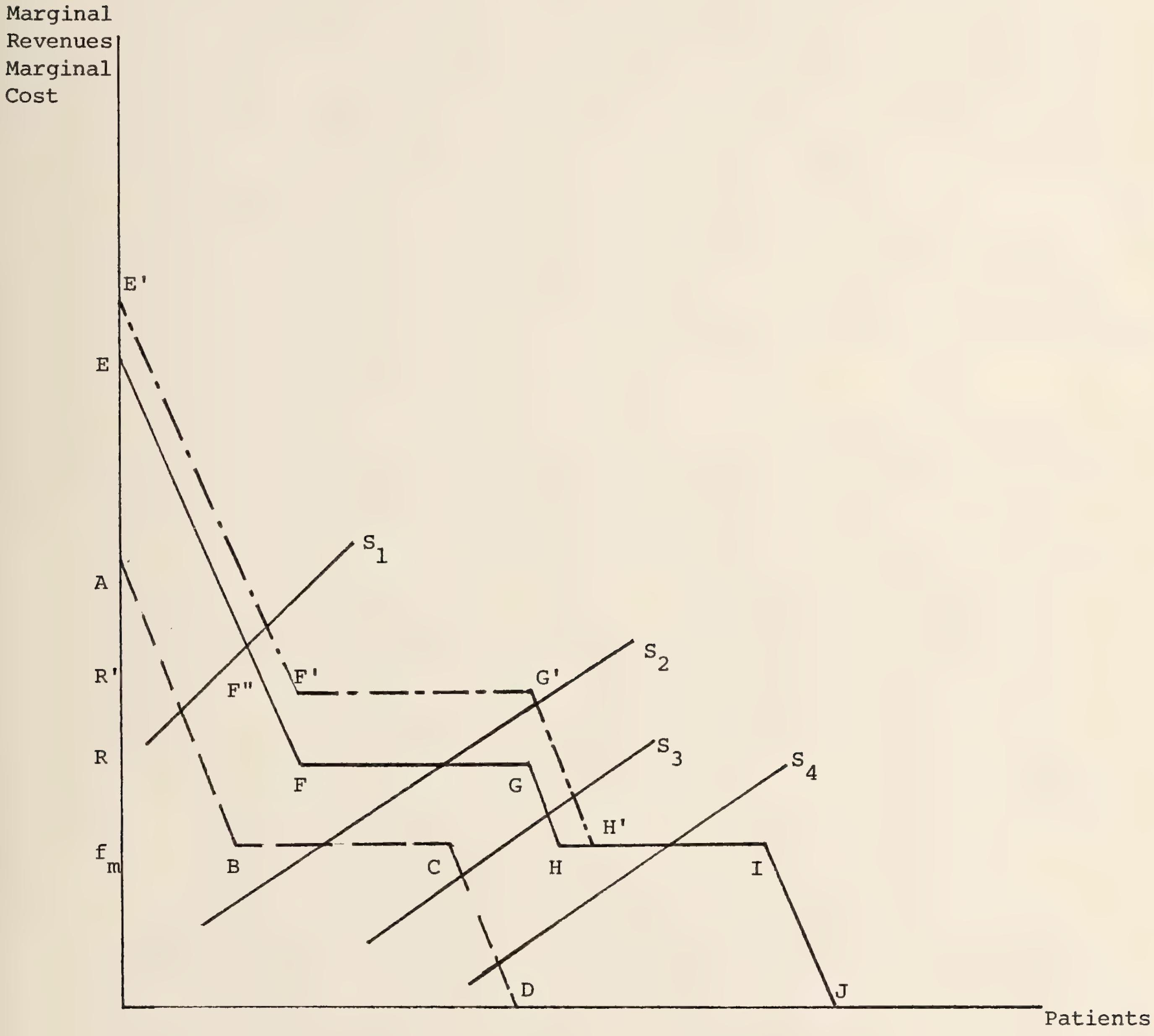

FIGURE 2-2: JOINT MEDICARE/MEDICAID PARTICIPATION MODEL

supply S_4 is also affected, reducing his Medicaid workload considerably (by H'-H). Only physician S_1 is unaffected because he was not seeing any Medicaid patients to begin with. He would continue to see some Medicare patients, but would not take any on assignment. Furthermore, according to our definition, only physician S_4 could be considered a fully participating public program physician, as he is the only one taking Medicare patients on assignment as well as participating in Medicaid.

In sum, the introduction of Medicare has the positive effect of increasing access of the elderly to physicians, but at the expense of poor Medicaid (and private) patients. _Ceteris paribus_, fewer physicians will participate in Medicaid, and those that do will likely reduce their level of participation.

2.2.1 Increases in Medicare/Medicaid Fees

An increase in the Medicaid fee schedule, shifting up the horizontal portion of the marginal revenue curve HI, should induce the Medicaid participating physician to expand his Medicaid practice as before. As Medicaid fees may never exceed the Medicare prevailing (and thus encourage the substitution of Medicaid for Mediare output), Medicare assignment rates would remain unchanged, and total public program participation for these physicians will necessarily increase. Whether physician participation rates will rise overall will depend on how many new physicians (like S_2) will opt into the program. Our previous work indicates that the effect of a Medicaid fee increase is substantially stronger for physicians already in the Medicaid market than for nonparticipants (Sloan, Cromwell and Mitchell, 1978).

An increase in the Medicare prevailing charge, corresponding to an upward shift in the Medicare portion of the demand curve (to E'F'G'H') should encourage the physician to accept assignment, although much of the effect is diluted by the case-by-case assignment option. This is due to the fact that non-assigned patients are now willing to pay more because they can collect more from Medicare. Instead of entering the Medicare market at F", where MR=R', physicians do not enter until F' nonassigned patients have been seen, the difference, F'-F", representing those patients now willing to pay more for non-assigned visits.* Thus, while physicians like

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*For a more detailed theoretical discusssion of this and other points related to Medicare in this context, see Mitchell and Cromwell (1981) and Paringer (1980).

S_2 do increase their assignment rates, the change is not nearly as great as it would have been. The Medicare program essentially competes with itself, setting assigned and unassigned patients against one another.

Because they are on different portions of their respective marginal revenue curves, Medicaid participants and nonparticipants should respond differently to an increase in the Medicare prevailing. The Medicaid non-participating physician (S_2) has not exhausted the assignment market and thus is able to accept more Medicare patients on assignment in response to a fee increase. His public program participation will uniformly increase as he substitutes assigned patients for non-assigned (albeit marginally if S_2 is quite inelastic) and Medicare patients generally for private patients. The joint Medicare-Medicaid participant, by contrast, has exhausted Medicare demand, for beyond G none of his Medicare patients are willing or able to pay anything for care (this point corresponds to the point where uninsured Medicare demand crosses the X-axis). He will switch a few patients from unassigned to assigned status and see more private patients willing to pay higher fees, thereby cutting into the Medicaid market by an amount, H'-H. Total public program participation may actually fall for these physicians as reductions in Medicaid workloads more than offset the marginal increase in assignment rates. Thus, relatively higher Medicare fees (relative to Medicaid) may lower overall public program participation. Higher Medicaid fees should definitely increase participation.

2.2.2 Changes in other Factors

Other private demand and supply variables will all have similar effects as previously discussed. Any variable increasing private demand like income and private insurance coverage will lower public program participation rates generally. As the lower paying public program, most of these effects will come first in the Medicaid program, then in the Medicare assignment market. General practitioners, non-board-certified, older physicians, and FMGs are hypothesized to have higher public program participation rates -- particularly for Medicaid. (Because of their high bills and collection difficulties, surgeons may be more willing to accept Medicare patients on assignment; see Ferry *et al.*, 1980.)

Larger Medicare populations will raise the demand for both assigned and non-assigned services. Previous work has shown that, holding income constant, the demand for non-assigned services dominates (Mitchell and Cromwell, 1981). Thus, more Medicare beneficiaries per capita will lower assignment rates, *ceteris paribus*, as well as reduce Medicaid participation. Medicaid participation, on the other hand, will be higher in areas with a relatively larger pool of Medicaid recipients. The higher the number of joint Medicare-Medicaid beneficiaries in this pool, furthermore, the larger will be the Medicare assignment rate.

Besides the usual supply factors like wage rates that affect participation, billing and collection costs associated with the two public programs will influence participation and assignment rates. Where relative collection costs are quite different, Medicare and Medicaid allowables would not accurately reflect net benefits to participation. Higher Medicare collection costs, *ceteris paribus*, would imply lower assignment rates and greater private and (possibly) Medicaid participation.

3.0 DATA SOURCES

3.1 Physician Surveys

The primary data bases for these analyses are the 1975, 1976, and 1977 physician surveys conducted by the National Opinion Research Center (NORC) for the Health Care Financing Administration (HCFA).* The 1975 survey included two independent samples, one national in scope, the other consisting of two regions (East South Central and Mid-Atlantic). With the appropriate weighting algorithm, the two samples can be combined into one nationally representative sample. The 1975 surveys were limited to the five primary care specialties: general practice, general surgery, internal medicine, obstetrics-gynecology (OB-GYN), and pediatrics. The 1976 and 1977 surveys were each a nationally representative sample of physicians in fifteen specialties: the five primary care specialties plus allergy, cardiology, dermatology, gastroenterology, neurological surgery, ophthalmology, orthopedic surgery, otolaryngology, psychiatry, and urology. The specialties included in each survey, as well as their respective unweighted sample sizes, are shown in Table 3-1.

All physicians were in office-based, private practice. There were a few other differences in the sampling methodology between the surveys. First, the two 1975 surveys were limited to fee-for-service physicians in practices with fourteen or fewer other physicians. Salaried physicians as well as those practicing in prepaid group practices were specifically excluded. In the 1976 and 1977 surveys, on the other hand, salaried and prepaid group practice physicians were included although they constitute a small proportion of the total samples. The practice size limit was also reduced from 14 or fewer physicians in the 1975 survey to nine or fewer physicians in 1976-1977.

Second, a clustered sampling procedure was used in 1975, selecting first primary sampling units (PSUs) based on region of the country and SMSA or county size and then selecting an equal probability sample of physicians

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*Data collection actually took place in 1976, 1977, and 1978; cost and income data refer to the previous calendar year. All other data, such as fees and visits, refer to the actual year in which they were obtained (1976-1978).

TABLE 3-1

UNWEIGHTED SAMPLE SIZES BY SURVEY YEARS AND SPECIALTY

	Survey Year		
	1975[a]	1976	1977
Allergy		148	140
Cardiology		100	124
Dermatology		126	147
Gastroenterology		94	95
General Practice	671	414	673
General Surgery	348	390	540
Internal Medicine	412	318	516
Neurosurgery		136	128
OB-GYN	335	414	633
Ophthalmology		154	200
Orthopedic Surgery		136	183
Otolaryngology		148	181
Pediatrics	257	327	566
Pediatric Surgery[b]		27	3
Psychiatry		415	574
Urology		135	162
All Specialties	2023	3482	4865

[a] Includes both national and regional surveys.

[b] Dropped from subsequent analyses because of small sample size.

within the five specialties. For the 1976 and 1977 surveys, a stratified-element (non-clustered) sampling procedure was used in which the strata were defined by specialty, geographic region, and county group size. In order to ensure that there would be sufficient cases for some analyses, certain strata were oversampled. Allergists, for example, were sampled at a higher rate than the more prevalent internists. In order to adjust for this disproportionate allocation, "weights" have been used in all analyses reported here. These weights serve to inflate the sample physicians to the larger physician population from which they were drawn. As the degrees of freedom for significance testing would also be inflated, the weights have been "normalized" by a constant n/N where n is the actual number of sample observations and N represents the population estimates obtained with the weights.

An extensive questionnaire was administered to all physicians, usually by telephone. This questionnaire included data on practice costs, work effort, size and type of practice, physician income, and fees. All information was based on physician self-reports. The content of the questionnaire also varied by survey year, notably between 1975 and 1976-1977. The major differences and similarities are summarized in Table 3-2. The single most important difference between the surveys was that questions on Medicare assignment were not included in 1976-1977. Thus, our analyses of the joint Medicaid-Medicare assignment decision and the all or nothing assignment requirement are limited to the 1975 sample of primary care physicians.

Measurement error might be present if physicians refused to participate in the survey, or if they reported inaccurate or incomplete information These types of errors are known as non-response bias and field bias, respectively. Extensive analysis of the 1975 survey found no evidence of measurement error (see Sloan, Cromwell, and Mitchell, pp. 14-21). The weights associated with the 1976 and 1977 samples, furthermore, include adjustments for nonresponse.

3.2 Secondary Data Sources

A number of additional data sources were merged with the physician surveys for these analyses. Biographic information on individual survey physicians was obtained from the AMA Masterfile, including such data as physician age, board-certification, and medical school. Variables describing the physician's county, such as demographic characteristics, were drawn from the Area Resource File. Two community variables, per capita income and

TABLE 3-2

AVAILABILITY OF SELECTED SURVEY DATA BY SURVEY YEAR

	Survey Year		
	1975	1976	1977
Physician Characteristics			
Specialty	X	X	X
Age and sex	X	X	X
Board certification	X	X	X
Medical school attended	X	X	X
Hospital affiliation		X	X
Medical school appointment	X		
Political attitudes	X		
Race	X		
Physician Work Effort and Caseload	X	X	X
Patient Characteristics			
Percent receiving Medicare and Medicaid	X	X	X
Percent black, Hispanic, low-income, high-income	X		
Medicare assignment rate	X		
Practice Characteristics			
Percent ancillary services ordered		X	X
Size and type of practice	X	X	X
Labor inputs	X	X	X
Practice costs	X	X	X
Physician gross and net incomes	X	X	X

physician-population ratios, were obtained from a more up-to-date source: the AMA's Physician Distribution and Medical Licensure in the U.S., 1976, 1977, and 1978.

Data on Medicare program characteristics, such as claims denial and investigation rates and the carrier rate of reduction, were obtained from a HCFA report authored by Charlotte Muller and Jonah Otelsberg (1979). Medicare prevailing charges were available from HCFA's Medicare Directory Of Prevailing Charges, 1976, 1977, and 1978. Medicaid program characteristics, such as eligibility and reimbursement procedures, were obtained from the Medicare-Medicaid Management Institute reports entitled Data on the Medicaid Program: Eligibility, Services, Expenditures. Measures of Medicaid recipients were obtained by county from the 1977 County and City Data Book and by state from the 1976-1978 U.S. Statistical Abstracts.

4.0 LARGE PUBLIC PROGRAM PRACTICES: PRIMARY CARE PHYSICIANS

Chapter 4 includes two independent, but related analyses of physicians who specialize in public program patients. Both analyses are based on primary care physicians: general practitioners, general surgeons, internists, OB-GYNs, and pediatricians. (The other physician specialties are discussed in Chapter 5.) In Section 4.1, we examine physicians with extra-large Medicaid practices (ELMPs), those who devote 56 percent of their practice on average to Medicaid patients. For this analysis, we pooled the 1976 and 1977 physician surveys; this more than doubled the sample size and enabled us to evaluate ELMPs on a specialty-specific basis. Decomposition by specialty is a critical first adjustment for casemix differences, but one we were not always able to make in our previous work. Section 4.2 examines physicians who participate extensively in both public programs: Medicaid and Medicare assignment. This analysis was limited to the 1975 national and regional surveys, as this was the only year in which assignment data were collected. Physicians with large Medicaid-Medicare assigned practices allocated 61 percent of their caseloads on average to these public program, fixed-fee patients.

4.1 Physicians With Extra-Large Medicaid Practices

4.1.1 Size Distribution of Medicaid Practices

In our previous work on extra-large Medicaid practices (ELMPs), a serious credentials gap was identified between physicians running these practices and those with small Medicaid practices (Mitchell and Cromwell, 1980). ELMP physicians were also found to make many more visits per week, particularly in their offices and in emergency rooms and outpatient clinics. Due to small sample sizes, our findings were based on all primary care physicians with no adjustment for specialty differences. Yet we know that these ELMPs included disproportionately more GPs who tend both to average higher caseloads and to have fewer qualifications. For the analyses reported here, we have combined the 1976 and 1977 surveys for a total unweighted sample size of 4,378 primary care physicians, including 266 ELMPs (see Table 4-1). This enables us to analyze ELMPs on a specialty-specific basis. Five specialties were included: general practice, general surgery, internal medicine, obstetrics-gynecology (OB-GYN), and pediatrics. The other ten specialties are analyzed in Chapter 5.

TABLE 4-1

UNWEIGHTED SAMPLES BY MEDICAID PRACTICE SIZE

Specialty	Medicaid Practice Size None	SMP	LMP	ELMP	Total
General Practice	207	616	102	60	985
General Surgery	109	645	63	47	864
Internal Medicine	161	499	62	39	761
Obstetrics-Gynecology	314	511	78	64	967
Pediatrics	175	519	51	56	801
Total	966	2790	356	266	4378[a]

[a] 413 cases dropped due to missing data.

Extra-large Medicaid practices (ELMPs) are defined differently than in our previous work. Rather than the absolute cut-off at 50 percent of practice we have determined the levels based on the mean percentage of Medicaid patients for each specialty. Large Medicaid practices (LMPs) are those with percent Medicaid patients at or above one standard deviation above the mean. Extra-large Medicaid practices are those with percent Medicaid patients at or above two standard deviations above the mean. The new definitions were used to allow for very different Medicaid participation rates across specialties. In addition, we were assured sufficient sample sizes by specialty for the ELMP analysis.

Table 4-2 presents the cut-off points by specialty for ELMPs, as well as the size distribution of Medicaid practices. A GP was classified as an ELMP, for example, if he devoted at least 45.7 percent of his practice to Medicaid patients (13.1 + 2*16.3). Average Medicaid participation rates and hence the ELMP definition varies considerably by specialty. Generally, an ELMP is composed of at least 40-50 percent Medicaid patients. Because of their very low participation rates, however, the ELMP cut-off for OB-GYNs is only 34 percent.* About six percent of all physicians fall into this ELMP category, with average Medicaid caseloads of 56 percent, ranging from 46 percent for OB-GYNs to 63 percent for pediatricians.

Although ELMPs represent a small proportion of all physician practices, they see a disproportionate number of all Medicaid patients. Using Medicaid mix and caseload data, estimates were derived of the total number of reported Medicaid patients in the sample (see Table 4-3). More than one out of every four Medicaid patients seen by a private physician nationwide is seen in an extra-large Medicaid practice. ELMP and LMP physicians together provide care to one-half of this Medicaid pool (50.2%). Thus a very small number of physicians appear to have assumed responsibility, for whatever reason, for a large proportion of the nation's poor.

In the tables that follow, data are presented for four groups of physicians: (1) extra-large Medicaid practices; (2) large Medicaid practices; (3) small Medicaid practices; and (4) those with no Medicaid patients. All statistical tests contrast ELMPs with small Medicaid practices (SMPs).

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*The relatively small Medicaid share of OB-GYN practices is particularly puzzling, given the large proportion of Medicaid recipients who are women of child-bearing age. There are several possible explanations: (1) Medicaid fees for maternity care may be particularly low; (2) both the physician and the patient may be uncertain of Medicaid eligibility, particularly if it is the first child; and (3) demand for prenatal care by Medicaid-eligible women may be low, due to lack of health education.

TABLE 4-2

SIZE DISTRIBUTION OF MEDICAID PRACTICES BY SPECIALTY

	Medicaid Practice Size[a]					
	None	SMP	LMP	ELMP	Average Participation Rate	ELMP Cut-off
General Practice	24.9%	60.0%	7.8%	6.7%	13.1%	45.7%
General Surgery	9.7	75.7	8.7	5.9	13.4	39.4
Internal Medicine	20.2	63.1	11.1	5.6	13.2	43.6
Obstetrics-Gynecology	35.6	52.0	6.3	6.2	8.4	34.0
Pediatrics	23.1	63.7	6.4	6.8	14.1	49.1
All	22.5	62.9	8.3	6.3	12.7	38.3

[a] Percent distribution sums to 100 by row.

TABLE 4-3

SIZE DISTRIBUTION OF MEDICAID PATIENTS BY MEDICAID PRACTICE SIZE

Medicaid Practice Size	Physicians	Medicaid Patients
None	22.5	0.0
SMP	62.9	49.8
LMP	8.3	22.7
ELMP	6.3	27.5
TOTAL	100.%	100.0%

4.1.2 Physician Credentials and Characteristics

To the extent that the Medicaid program is a secondary market for physician services, then physicians serving disproportionately large numbers of these patients (ELMPs) are apt to have fewer credentials than other physicians. Table 4-4 provides support for this hypothesis; ELMP physicians do tend to be less qualified on average compared with SMPs even though there are no real specialty differences between the two groups (although there are significantly fewer general surgeons in ELMPs). ELMP physicians are significantly less likely to be board-certified, no matter what their specialty. Only one out of four ELMPs is run by a board-certified physician, compared with almost one-half of the SMPs. Internists with extra-large Medicaid practices have particularly low rates of board-certification, 14.8 percent compared with 47.1 percent for their SMP colleagues.

ELMP physicians are also more likely to be foreign medical graduates, and significantly so for three of the five specialties. One out of every five physicians with an extra-large Medicaid practice was trained outside the U.S.; for internists and pediatricians it is even higher. Using the more restrictive definition of Third World FMG, ELMPs include more foreign medical graduates, but the differences are significant only for OB-GYNs and pediatricians. ELMP physicians in these two specialties are two to three times as likely to be Third World FMGs.

Finally, although ELMP general practitioners appear less likely to be affiliated with a hospital, the difference is not significant. Access by Medicaid patients to hospital services thus would not seem to be impaired due to the physician's lack of admitting privileges.

We might expect ELMPs to include disproportionate numbers of very young and very old physicians. At both ends of a physician's career, private demand may be low thus encouraging treatment of low marginal revenue Medicaid patients. Table 4-5 suggests that younger physicians, at least internists and pediatricians, are more willing to see large numbers of Medicaid patients. ELMP general practitioners, on the other hand, are significantly less likely to be under 40 years of age compared with those in SMPs. Holding specialty constant, there is no consistent trend for older physicians (60 years and over) to run ELMPs.

TABLE 4-4

PHYSICIAN CREDENTIALS BY SIZE OF MEDICAID PRACTICE (%)

	Specialty				Board Certification			
	None	SMP	LMP	ELMP	None	SMP	LMP	ELMP
GPs	44.6	38.8	37.6	43.0	9.9	22.0	19.1	7.2***
General Surgeons	7.3	20.5	17.8	16.1*	56.8	70.2	50.2	59.3*
Internists	19.0	21.2	28.2	18.8	47.5	47.1	36.3	14.8***
OB-GYNs	19.7	10.3	9.4	12.2	66.8	72.3	61.7	46.2***
Pediatricians	23.1	9.2	7.0	9.9	70.6	67.9	45.1	40.0***
ALL	--	--	--	--	37.4	46.6	53.3	25.0***

	Foreign Medical Graduate				Third World FMG			
	None	SMP	LMP	ELMP	None	SMP	LMP	ELMP
GPs	4.4	9.0	14.7	9.4	2.5	5.0	1.6	6.4
General Surgeons	15.7	12.9	19.3	16.1	6.7	10.9	7.9	14.2
Internists	8.8	15.1	25.1	42.3***	4.1	10.5	20.7	13.7
OB-GYNs	15.7	13.2	29.6	23.3**	8.2	9.1	14.6	19.4**
Pediatricians	13.6	15.8	13.6	36.3***	9.3	12.3	10.6	33.2***
ALL	9.2	12.2	19.8	21.0***	4.9	8.5	9.9	13.2***

	No Hospital Affiliation			
	None	SMP	LMP	ELMP
GPs	9.4	3.7	4.2	6.8
General Surgeons	1.3	1.8	0.0	0.8
Internists	0.7	0.8	0.7	0.8
OB-GYNs	1.3	1.6	0.0	0.0
Pediatricians	1.3	0.1	0.9	0.0
ALL	4.8	2.2	1.8	3.2

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

TABLE 4-5

PERSONAL PHYSICIAN CHARACTERISTICS BY SIZE OF MEDICAID PRACTICE (%)

	Medicaid Practice Size			
	None	SMP	LMP	ELMP
Age < 40 years				
General Practitioner	15.7%	14.4%	9.2%	5.6%**
General Surgeon	7.1	15.5	13.8	9.8
Internist	8.9	17.7	9.4	42.9***
OB-GYN	13.5	21.5	21.5	26.7
Pediatrician	21.1	25.8	14.8	39.4**
All	13.8	17.1	11.6	19.2
Age ≥ 60 years				
General Practitioner	41.0	25.8	25.7	34.5
General Surgeon	45.9	24.1	22.0	27.0
Internist	26.7	19.2	35.7	29.2
OB-GYN	24.3	18.7	11.1	8.1
Pediatrician	9.6	17.1	21.5	7.1**
All	32.4	22.5	26.2	26.4*
Sex - Female				
General Practitioner	2.5	2.7	2.4	3.9
General Surgeon	3.6	1.1	2.1	1.0
Internist	3.6	4.6	5.6	5.7
OB-GYN	6.2	7.9	2.8	6.7
Pediatrician	10.3	10.6	46.3	32.8***
All	4.2	4.0	6.4	6.9**

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

Low private demand due to discrimination may lead black and female physicians to have high Medicaid caseloads. Unfortunately we have no data on physician race from the 1976-1977 surveys, but we do know the sex of the physician. There is a slight overrepresentation of female physicians among ELMPs, but it is significant only among pediatricians. There the differences are substantial, however; ELMP pediatricians are three times as likely to be women as are their SMP colleagues (32.8% versus 10.6%).

4.1.3 Caseload and Work Effort

After adjusting for specialty differences, earlier evidence that ELMPs work harder and see more patients than other physicians is not supported, as seen in Table 4-6. Although ELMP physicians generally see more office patients (about 13% more), the difference is significant only for general surgeons and pediatricians. ELMP pediatricians average approximately 20 patients more per week than SMP pediatricians, but at the same time see fewer patients in ERs or clinics. The latter is in marked contrast to a general ELMP tendency to allocate a disproportionate amount of their caseload to these traditional institutional settings. ELMP internists see three times as many patients in ERs and clinics, for example, as do their SMP colleagues. These ER/clinic patients represent 11 percent of their total caseload compared with only 3 percent of SMP internists' caseloads.

Generally, ELMP physicians do not work any harder than other physicians, spending 51 hours per week in patient care activities compared with 52 for SMPs. Comparable caseloads and work effort generally implies comparable visit lengths, and we see in Table 4-6 that there are no significant differences in length of office visit between ELMPs and SMPs, even after specialty adjustment. A notable exception are the ELMP internists who work almost five hours less than SMP internists. Office visits are not any shorter in their practices, however, so the work effort reduction must take place somewhere else, such as in the hospital. As noted earlier, ELMP internists actually treat more ER and clinic patients but they also make significantly fewer inpatient visits. (This is somewhat surprising, given their higher frequency of

TABLE 4-6

WORK EFFORT AND CASELOAD BY MEDICAID PRACTICE SIZE

Specialty	None	SMP	LMP	ELMP
All Physicians				
Total Visits	160.4	168.9	186.9	176.9
Total Hours	47.5	51.7	52.4	50.6
Length of Office Visit (minutes)	21.9	20.5	18.8	19.9
Office Visits	110.3	104.5	114.0	118.2***
Inpatient Visits	38.7	48.6	49.8	39.7***
ER/Clinic Visits	4.1	8.2	13.3	11.2***
Operations	2.3	3.1	2.9	3.4
House Calls	2.1	1.2	1.1	0.8
Nursing Home Visits	2.9	3.2	5.8	3.6
General Practitioners				
Total Visits	184.7	194.1	221.7	208.5
Total Hours	47.4	53.3	53.5	54.0
Length of Office Visit (minutes)	19.8	18.5	16.4	17.7
Office Visits	133.1	135.1	154.3	148.7
Inpatient Visits	39.2	40.6	45.0	37.6
ER/Clinic Visits	2.6	9.8	9.7	13.6
Operations	0.8	1.4	1.8	1.2
House Calls	4.1	2.2	1.5	1.2*
Nursing Home Visits	4.8	5.1	9.3	6.2
General Surgeons				
Total Visits	134.6	150.5	169.0	154.9
Total Hours	47.2	51.5	53.0	51.0
Length of Office Visit (minutes)	26.3	19.5	20.7	21.5
Office Visits	59.5	62.1	67.1	77.3*
Inpatient Visits	60.0	66.5	71.9	57.9
ER/Clinic Visits	7.0	11.9	21.5	9.1
Operations	7.2	8.6	6.7	9.0
House Calls	0.2	0.6	0.3	0.3
Nursing Home Visits	0.8	0.7	1.5	1.3

TABLE 4-6 cont.

WORK EFFORT AND CASELOAD BY MEDICAID PRACTICE SIZE

Specialty	None	SMP	LMP	ELMP
Internists				
Total Visits	123.3	145.6	161.5	137.3
Total Hours	45.6	50.4	49.1	45.8**
Length of Office Visit (minutes)	28.4	25.5	21.7	25.7
Office Visits	72.5	79.0	88.5	77.3
Inpatient Visits	41.4	57.3	50.0	38.0***
ER/Clinic Visits	5.3	4.4	13.8	15.5***
Operations	0.2	0.3	1.1	1.2***
House Calls	1.0	0.9	1.2	1.3
Nursing Home Visits	2.9	4.2	6.9	4.1
OB-GYNs				
Total Visits	144.6	155.0	161.1	151.8
Total Hours	49.3	52.0	56.5	50.1
Length of Office Visit (minutes)	19.1	19.7	16.9	19.4
Office Visits	99.5	101.8	104.7	101.2
Inpatient Visits	33.0	41.3	41.2	34.8
ER/Clinic Visits	4.9	3.4	7.1	6.4***
Operations	6.9	7.3	8.0	9.4***
House Calls	0.0	0.1	0.0	0.0
Nursing Home Visits	0.3	1.1	0.0	0.0
Pediatricians				
Total Visits	173.2	172.7	182.8	182.1
Total Hours	48.1	47.3	53.2	45.4
Length of Office Visits (minutes)	21.4	20.5	17.2	16.7
Office Visits	141.6	132.7	131.8	151.3**
Inpatient Visits	25.7	30.9	30.4	28.9
ER/Clinic Visits	5.0	8.1	17.6	1.7**
Operations	0.3	0.2	0.4	0.1
House Calls	0.2	0.3	1.7	0.1
Nursing Home Visits	0.4	0.4	1.0	0.0

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

operations.) ELMP internists see only 66 percent as many hospital patients as do SMP internists; at 10 minutes a visit, this could account for over 3 hours of their shorter work week.

Finally, OB-GYNs with ELMPs perform significantly more operations than their SMP colleagues, about 2 more per week on average. Since this visit category may include such diverse procedures as hysterectomies, "D & Cs", and deliveries, it is difficult to interpret this finding. What is surprising, however, is the small number of inpatient visits made by these OB-GYNs given their higher surgical workloads. SMP OB-GYNs average 5.7 inpatient visits per week for every operation they perform, compared with only 3.7 visits for ELMPs. Since ELMP OB-GYNs also make significantly more ER visits, some of which should result in hospital admission, the difference is probably even greater. There are at least two explanations for this finding. First, the visit-operation ratio may be biased upwards for OB-GYNs in SMPs if they tend to admit more medical (non-surgical) patients to the hospital. Second, ELMPs may be treating a much healthier patient population that requires fewer inpatient visits; examples might include deliveries (which would be consistent with the Medicaid casemix), abortions, and diagnostic surgical procedures such as laparoscopies. In the absence of more detailed patient mix data, we cannot tell for sure.

4.1.4 Physician Earnings

One of the biggest concerns of policymakers is that physicians with unusually large Medicaid caseloads may also be making extraordinary incomes. Our previous work with large and extra-large Medicaid practices showed that this was not the case. An equal concern, however, is whether ELMP physicians may be unfairly penalized for serving the poor. Table 4-7 reports physician net incomes adjusted for regional cost-of-living differences; hence, not only specialty mix but geographic location is held constant in comparing incomes. Treating large numbers of Medicaid patients does not appear to have a consistent impact on yearly earnings. GPs and general surgeons in ELMPs earn significantly less than those in SMPs, while ELMP internists actually earn more. The latter is particularly surprising, given their lower work effort.

TABLE 4-7

PHYSICIAN NET INCOMES[a] (AND IMPUTED HOURLY WAGES) BY SIZE OF MEDICAID PRACTICE

	Medicaid Practice Size			
Specialty	None	SMP	LMP	ELMP
General Practitioners	$52,200 ($25.04)	$59,160 ($24.92)	$57,872 ($24.42)	$49,211*** ($19.92)***
General Surgeons	56,875 (26.70)	73,830 (32.52)	76,305 (31.84)	65,643* (31.29)
Internists	52,943 (27.61)	61,323 (27.40)	58,869 (26.20)	69,091** (31.67)**
OB-GYNs	67,859 (31.87)	71,025 (31.28)	78,765 (30.65)	71,886 (31.32)
Pediatricians	54,769 (24.86)	53,885 (25.10)	51,180 (23.92)	49,376 (24.24)
All Physicians	56,008 (26.98)	63,363 (27.68)	62,926 (26.79)	58,380*** (25.77)**

[a] In $1977, adjusted for geographic cost-of-living differences.

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

Variations in net incomes are open to interpretation depending on the underlying source of variation. Net incomes (Y) can be decomposed as:

$$Y = \left[\frac{GR}{V} - \frac{C}{V}\right] \cdot \frac{V}{MH} \cdot MH \qquad (4.1)$$

where GR/V = gross revenues per visits, C/V = average cost per visit, V/MH = visits per physician hour, and MH = total physician hours. Net incomes in some extra-large Medicaid practices could be higher than elsewhere because (a) gross incomes per visit are higher, (b) average costs were lower, (c) physician time with the patient is shorter, or (d) work effort is greater. We have already seen (Table 4-6) that physician-patient contact time does not vary between ELMPs and SMPs but that work effort does, at least for internists.

Table 4-7 also presents physician net incomes adjusted for both cost-of-living and hours worked. The result is an imputed real wage which stands as a rough measure of the physician's economic return to labor.* Adjusting income for work effort does not alter the overall conclusion that ELMP physicians are not enjoying extraordinary returns. If anything, hourly earnings are about $2 lower in practices serving large numbers of Medicaid patients. This is particularly true of general practitioners in ELMPs whose earnings per hour are five dollars, or 25 percent, less than those in SMPs. Internists in ELMPs are the sole exception: adjusting for hours worked actually exacerbates the earnings differential.

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*Wages imputed from reported earnings and hours worked information of self-employed entrepreneurs invariably include a return to capital as well. That is, reported practice earnings will usually include a return to physician effort plus some (unknown) return to the other inputs (e.g., medical equipment, space). A physician working an hour in a capital-intensive practice is likely to be much more productive. If he were salaried, his wage would theoretically include only his marginal contribution to output. As a self-employed entrepreneur, he naturally appropriates both the return to his own labor plus that flowing to the other inputs owned by the practice. Thus the data presented in Table 4-7 are not returns to labor strictly speaking, but something more. While one could argue that extraordinary earnings/hours-worked ratios may be due to returns to entrepreneurship rather than labor, and hence are efficient, equity concerns remain. For another discussion of this point, see Sloan (1974).

Even though most ELMP physicians report incomes and earnings per hour no higher than in other practices and often lower, one could still argue that these hourly earnings are unjustified given their background and training. Earlier in Section 4.1.2, for example, we saw that ELMP physicians were much more likely to be foreign trained and less likely to be board-certified. To test this hypothesis, adjusted hourly earnings of all physicians were regressed on the list of physician credentials, personal demand characteristics (age and sex), and other exogenous variables that might affect returns to labor. * The latter include: percent of population over 65 (a proxy for Medicare coverage and health status); county per capita income, cost-of-living adjusted (a demand proxy); the physician-population ratio (a measure of physician competition and individual demand); and dummy variables for specialty (measures of demand and return to additional training). Positive residuals from this regression should reflect returns over-and-above those attributable either to the background and training of the physician or to location choice. If, on the other hand, ELMP physicians are earning even less than might be expected from their credentials or from economic factors, then residuals should be negative.

Because physician earnings are of interest in their own right, the wage regression is presented in Table 4-8. Almost all of the variables are highly significant in the expected directions. Surgeons (GS,OB) enjoy significantly higher returns relative to GPs: $6-7 holding other variables constant. Specializing in internal medicine (IM) brings more modest rewards ($1.68), but still more than pediatrics (PED) or general practice (in the intercept). Being board-certified (BOARD) raises hourly earnings about $1.50 holding specialty constant, and being foreign trained (FMG) lowers them $3.80. The lack of hospital admitting privileges (NOHOSP) has a particularly large, downward impact on wages ($7.76). More experienced physicians (MDAGE) enjoy higher returns but at a declining rate as they grow older. Women physicians (FEMALE) earn significantly less,

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*This list was drawn from Sloan (1974). For a theoretical discussion of the hours worked equation, the reader is referred to his work. All physicians in our sample were self-employed, fee-for-service practitioners; hence no variables are included to capture other reimbursement arrangements, such as salary.

TABLE 4-8

PHYSICIAN IMPUTED HOURLY WAGE REGRESSION AND RESIDUAL ANALYSIS FOR MEDICAID PRACTICES

Variables	Regression Coefficients
GS	6.95***
IM	1.68***
OB	5.94***
PED	-0.55
BOARD	1.49***
FMG	-3.80***
NOHOSP	-7.76***
MDAGE	0.50***
MDAGESQ	-0.006***
FEMALE	-3.52***
Y	0.55**
OVER65	-0.04***
MDPOP	-0.01
LMETRO	-5.87***
SMETRO	-3.82***
CONSTANT	26.49***

$R^2(c) = 0.08$

$F(15,4313) = 26.60$***

	Medicaid Practice Size			
	None	SMP	LMP	ELMP
Mean Wage Residual	0.60	-0.05	0.19	-1.99**

Note: See text for variable definitions.

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

even after adjusting for work effort and specialty. Higher per capita incomes (Y) raise demand and hence wages, but the pool of elderly patients (OVER65) inexplicably depresses earnings. Physician competition (MDPOP) surprisingly has no effect on wages, but location in large and small metropolitan areas (LMETRO,SMETRO) does lower them relative to non-metropolitan areas after a cost-of-living adjustment is applied.

Residuals for ELMP physicians were negative and highly significant, as shown in Table 4-8. Holding both credentials and economic factors constant, ELMP physicians earn about \$2 less per hour than physicians with small Medicaid practices (LMPs are unaffected). This finding is consistent with Chapter 2.0's theory in which physicians serving the Medicaid market receive lower fees, both from Medicaid and their private practice generally. Thus, ELMP physicians definitely appear to suffer financially from their decision to see large numbers of Medicaid patients. There are, however, a few physicians who do manage to earn high incomes, despite a large or extra-large Medicaid practice, and we analyze these separately in Chapter 6.

Any residual income difference in hourly net incomes once work effort is accounted for would have to be explained by variations in the other components, variations which may or may not be efficient and equitable. Taking each in turn, gross revenues per visit can be considered as the weighted average of visit and ancillary fees from Medicaid and non-Medicaid patients:

$$\frac{GR}{V} = \left[f_{vo} + f_{ao} \cdot \frac{ANC_0}{V_o}\right] \cdot \frac{V_o}{V} + \left[f_m + f_{am} \cdot \frac{ANC_m}{V_m}\right] \cdot \frac{V_m}{V} , \tag{4.2}$$

where f_{vo}, f_{vm} = average visit fees for non-Medicaid and Medicaid patients, respectively, f_{ao}, f_{am} = average ancillary fees, ANC_o/V_o, ANC_m/V_m = average number of ancillaries per visit, and V_o, V_m = total non-Medicaid and Medicaid visits. Medicaid visit fees are generally not the focus of criticism of large Medicaid practices, as fees tend to be considerably below those of other insurors. Rather the concern has been more with unnecessary ancillary utilization, or ANC_m/V_m. Both visit

and ancillary fees are rigidly set under state Medicaid programs but not ancillary utilization. This is left to individual physician discretion. We examine ancillary use in extra-large Medicaid practices later in Section 4.1.6.

Besides looking at ancillary revenues, we also include an analysis of physician gross markups per visit, $\left[\frac{GR}{V} - \frac{C}{V}\right]$ including revenues from all practice sources and nonphysician costs. Ceteris paribus, markups should be lower in ELMPs because Medicaid fees are lower, but this does not necessarily have to be the case if ELMP physicians are (a) charging higher fees to non-Medicaid patients, (b) generating unnecessary, but highly profitable, ancillary services, or (3) keeping costs per visit low. High markups do not necessarily mean malfeasance, but may suggest undesirable behavior of one type or another. One way of keeping per visit costs low would be to skimp on inputs. We examine this directly in Section 4.1.7 by decomposing the labor mix of physician practices by extent of Medicaid participation.

4.1.5 Gross Revenues, Costs, and Markups

Policymakers have been concerned that some physicians are enjoying unusually high returns from treating Medicaid patients. If this is the case, it is not reflected in physician net incomes as we have already shown: even after adjusting for hours worked, credentials, and exogenous economic conditions, ELMP physicians earn less than other physicians (although a few do enjoy very high incomes). There is another way, however, that physicians could abuse the system, however, through excessive markups over costs.*

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*Markups and profits are not identical for self-employed entrepreneurs. Physician markups include a return to labor while profits, strictly speaking, include only a return to managerial and equity input. Stockholders in other industries enjoy much lower returns primarily because they contribute a relatively small part (i.e., capital) to the overall operation of the firm while physicians also supply their own labor.

What is of concern here is not whether physician markups are high, but rather whether those charged by ELMP physicians are unusual. A crude estimate of expected markups can be had immediately using a simple relationship between incomes (Y), markups (M) and visits (V):

$$\frac{M_{ELMP}}{M_{SMP}} = \frac{Y_{ELMP}}{Y_{SMP}} \cdot \frac{V_{SMP}}{V_{ELMP}} \tag{4.3}$$

If ELMPs and SMPs saw the same number of patients per week, markups would vary proportionately with incomes. Because ELMPs report seeing 5 percent more patients (177 vs. 169 in SMPs), relative markups in ELMPs vs. SMPs should average only 95 percent of relative differences in income. If incomes in ELMPs and SMPs were the same, then, given the difference in volumes, relative markups would be 5 percent lower in ELMPs. In instances where ELMP incomes were lower, markups would be even less, holding visits constant. Any abuse that might be occurring clearly does not manifest itself either in incomes or in markups: ELMP physicians are earning lower incomes on average even though they are seeing about the same number patients, two facts which necessarily imply lower markups.

Lower markups in ELMPs, on the other hand, are not surprising given the relatively large number of low-paying Medicaid patients. Higher average costs, greater bad debts, and lower fees from private patients could also explain these low markups. In this section we decompose markups into three components, revenues, costs, and fees, to determine the source of the variation in ELMP and SMP markups.

Markups in the usual sense of the word measure the extent to which prices exceed average costs. Physician practices, as in most businesses, provide a number of services, each with its own markup. The unusual thing about a physician's practice is that markups generally will include a return to physician effort which is left out of accounting costs. Lack of individual fee and volume data makes it impossible to distinguish markups on every service; the best we can do is use some measure of gross billings per visit to approximate average prices (supplemented by some specific fee data). Furthermore, physician

billings will exceed gross revenues by an amount equal to bad debts. Losses should be subtracted from billings to arrive at a more meaningful transactions price.

Estimation of physician costs can only be done indirectly, using available survey data. Total practice costs are calculated as the sum of office rent or depreciation, medical equipment lease or depreciation, medical supplies, physician's automobile costs, total wages paid to physician employees, total wages paid to non-physician employees, and malpractice insurance. This sum is per physician in practice, and is presented in Table 4-9 on a per visit basis.*

For physicians as a whole, both gross revenues and markups fall as extent of Medicaid participation increases. The average ELMP markup is 91 percent of the SMP markup ($9.72/$10.66), which is lower than the predicted 95 percent discussed above. Average cost per visit is almost identical between the two groups: $6.26 for ELMPs and $6.32 for SMPs. ELMP markups are thus lower primarily due to lower gross revenues per visit.

Adjusting for specialty reveals some surprising differences. GPs, general surgeons, and pediatricians exhibit the same decline in gross and net revenues as Medicaid participation increases. Internists and

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*On the cost side there is the question of how pensions and officers' compensation in incorporated practices are to be treated. If physicians in one type of practice choose to take part of their income in the form of wages, or defer it to some future period, then *ceteris paribus* practice costs will be higher and markups lower. Unless these costs involve unique returns to physician labor not incurred in other kinds of practices (e.g., more time administering a large practice), including them will introduce error into our estimates of markups and possibly bias the results. Pensions and officers' compensation are generally regarded as advantages to incorporation rather than payments for effort not incurred in unincorporated practices so it seems reasonable to exclude them from costs in calculating markups. This way, markups will provide a measure of the net (before tax) return to physicians of an average patient visit and will include both a return to physician labor and entrepreneurship. If high ELMP gross revenues are being offset by high pensions and officers' compensation resulting in arbitrarily low markups, decomposing markups into revenues and costs should bear this out.

TABLE 4-9

GROSS REVENUES, COSTS, AND MARK-UPS BY SIZE OF MEDICAID PRACTICE

	Medicaid Practice Size				
	None	SMP	LMP	ELMP	All Practices
General Practitioner					
GR/V	$15.51	$13.63	$12.54	$11.34	$13.83
C/V	6.88	5.49	5.28	5.09	5.76
Net R/V	8.62	8.14	7.26	6.25	8.07
General Surgeon					
GR/V	21.33	20.69	23.15	19.35	20.79
C/V	9.57	6.89	8.71	6.75	7.28
Net R/V	11.76	13.80	14.44	12.60	13.51
Internist					
GR/V	19.17	18.99	17.61	20.99	18.73
C/V	7.30	6.94	6.31	7.25	6.88
Net R/V	11.87	12.04	11.31	13.74	11.85
OB-GYN					
GR/V	21.73	21.95	19.30	23.14	21.25
C/V	8.10	8.20	7.51	8.89	8.14
Net R/V	13.63	13.75	11.78	14.24	13.11
Pediatrician					
GR/V	15.26	12.76	13.00	11.50	13.46
C/V	5.54	5.01	5.85	5.22	5.28
Net R/V	9.72	7.75	7.15	6.28	8.18
All Physicians					
GR/V	17.85	16.98	16.88	15.98	17.10
C/V	7.28	6.32	6.53	6.26	6.55
Net R/V	10.58	10.66	10.35	9.72	10.56

Key: GR/V = gross revenues per visit
C/V = practice costs per visit
Net R/V = net revenues per visit (mark-ups)

OB-GYNs in extra-large Medicaid practices report higher gross and net revenues per visit, compared with SMPs. Costs per visit are also higher, suggesting that ELMP visits may be more intensive. Higher ancillary use in ELMPs would explain both their higher costs and their higher gross revenues. Greater use of auxiliary personnel would only raise costs. (Since there are no differences in office visit lengths, we know that the physicians are not substituting aide time for their own time.) We examine both ancillary utilization and that of nonphysician inputs in the subsequent two sections. If Medicaid patients tend to be sicker, requiring more intensive services, this could explain higher costs and gross revenues, but it cannot justify the higher markups as well. The difference in OB-GYN markups is small, but ELMP internists net 14 percent more per visit than their SMP colleagues. A sicker Medicaid casemix, furthermore, cannot explain the lower costs and revenues of ELMP physicians in the other three specialties.

Ceteris paribus, we would expect gross revenues per visit to decline with Medicaid participation because of low Medicaid fees. Tables 4-10 and 4-11 display usual and Medicaid fees for follow-up office and hospital visits and for a few selected specialty-specific procedures. As expected, Medicaid fees for all procedures are below usual fees, in most instances considerably below. An ELMP physician would bill a private patient $16.85 for a hospital visit, but only receive $9.94 for a Medicaid patient, a difference of 41 percent.* Usual fees for ELMP physicians are generally (but not always) lower than those for SMP physicians, a finding consistent with our two-market demand model in Chapter 2. ELMP physicians also enjoy higher Medicaid fees, a factor undoubtedly encouraging their participation to begin with. Of course, SMP physicians receive even less from Medicaid relative to their usual fee (a difference of 49% using the hospital visit fee example), but because their Medicaid caseloads are so much smaller, their average revenues will still be higher compared with ELMPs. An ELMP physician, for example, would receive an average of $13.05

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*This is undoubtedly an overestimate by some unknown amount as physicians generally receive less than their usual fee, because of bad debts and reduced fees.

TABLE 4-10

USUAL AND MEDICAID FEES[a] FOR ROUTINE HOSPITAL AND OFFICE VISITS BY SPECIALTY AND MEDICAID PRACTICE SIZE

Hospital Visit Fee	None[b]	SMP	LMP	ELMP
General Practitioner				
Usual	$17.21	$16.04	$14.62	$14.10
Medicaid		8.80	9.40	10.54
General Surgeon				
Usual	18.40	19.12	19.78	20.45
Medicaid		8.73	13.13	9.64
Internist				
Usual	20.09	20.40	16.53	22.21
Medicaid		9.68	9.44	10.92
OB-GYN				
Usual	21.14	17.55	15.93	17.09
Medicaid		8.70	9.10	10.32
Pediatrician				
Usual	18.42	17.08	17.31	15.90
Medicaid		9.50	10.07	11.04
All Physicians				
Usual	18.48	17.86	16.14	16.85
Medicaid		9.08	9.91	9.94

TABLE 4-10 cont.

USUAL AND MEDICAID FEES[a] FOR ROUTINE HOSPITAL AND OFFICE VISITS BY SPECIALTY AND MEDICAID PRACTICE SIZE

Office Visit Fee	None[b]	SMP	LMP	ELMP
General Practitioner				
Usual	12.64	12.80	13.24	12.65
Medicaid		8.30	8.82	8.93
General Surgeon				
Usual	15.53	15.28	18.47	14.87
Medicaid		8.43	12.08	8.45
Internist				
Usual	$17.79	$17.12	$15.25	$18.63
Medicaid		9.83	8.70	8.96
OB-GYN				
Usual	20.11	17.39	16.61	16.16
Medicaid		9.99	10.31	10.93
Pediatrician				
Usual	14.26	12.90	13.06	13.03
Medicaid		8.75	10.50	9.80
All Physicians				
Usual	15.30	14.64	14.84	14.57
Medicaid		8.88	9.46	9.69

[a] All fees in $1978, adjusted for geographic cost-of-living differences.

[b] Non-participating physicians did not report Medicaid fees.

TABLE 4-11

USUAL AND MEDICAID FEES[a] FOR SPECIALTY-SPECIFIC PROCEDURES BY SIZE OF MEDICAID PRACTICE

		Medicaid Practice Size		
Procedure Fees	None[b]	SMP	LMP	ELMP
Cholecystectomy (GS)				
Usual	$701.99	$682.17	$739.24	$683.63
Medicaid		312.27	410.22	353.85
Hernia Repair (GS)				
Usual	415.38	421.65	496.95	442.41
Medicaid		204.30	246.35	213.20
Electrocardiogram (IM)				
Usual	25.15	24.31	25.01	27.10
Medicaid		14.21	17.05	16.92
Proctoscope exam (IM)				
Usual	27.02	28.86	29.09	33.40
Medicaid		15.91	18.01	17.07
Diagnostic D & C (OB)				
Usual	229.41	202.62	224.31	204.65
Medicaid		83.59	111.26	103.24
Delivery (OB)				
Usual	571.56	523.60	560.52	516.83
Medicaid		237.50	303.67	245.63
Spinal Puncture (PED)				
Usual	22.07	22.16	17.67	22.92
Medicaid		11.44	10.60	10.72

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[a] All fees in $1978, adjusted for geographic cost-of-living differences.

[b] Non-participating physicians did not report Medicaid fees.

for a routine inpatient visit ($16.85*0.45+$9.94*0.55), adjusting average fees for the non-Medicaid and Medicaid shares of his practice. An SMP physician, on the other hand, would receive $16.98 on average ($16.86*0.90+ $9.08*0.10). ELMP physicians thus would average only 76 percent of what SMP physicians would because of differences in Medicaid proportions and fees.

4.1.6 Ancillary Services

Each survey physician was asked to estimate the percent of office visits for which he ordered the following four types of services: laboratory tests, injections or immunizations, x-ray films, and office surgery. Although it is not possible to determine the medical necessity of ancillary services provided in ELMPs, we can compose the frequency with which they are ordered relative to SMPs (Table 4-12). ELMP physicians order laboratory tests at the same rate as SMP physicians, with internists actually prescribing significantly fewer. We might have expected a much more marked difference between the two, however, as ELMP physicians are significantly less likely to have internalized laboratory work. Only 45.3 percent of ELMPs have someone in their office to perform simple lab tests, compared with 71.5 percent of SMPs. (The differences are significant for all specialties, except general surgery).

Utilization of other ancillary services does vary considerably between ELMPs and SMPs but often in opposite directions and with no clear patterns by specialty. ELMP general surgeons order more injections, for example, but do less office surgery. ELMP internists provide significantly more of all three services. They prescribe injections for almost one-half of all their office patients (40.4%), a rate two and a half times that of SMP internists. ELMP internists order x-rays for one out of every three patients, compared with one out of four SMP patients. Finally, they perform office surgery five times more often than do other internists, a rate actually more comparable to general surgeons. These high rates may well explain the unusually high incomes enjoyed by ELMP internists. Are these ancillary services ordered at excessively high rates? Without more detailed casemix data, it is difficult to say for sure. If Medicaid patients were sicker and required greater ancillaries, we might expect these high rates, but then why don't other ELMP physicians show higher utilization rates as well?

TABLE 4-12

ANCILLARY SERVICES[a] BY SIZE OF MEDICAID PRACTICE

	Medicaid Practice Size			
	None	SMP	LMP	ELMP
Laboratory Tests	39.4%	34.1%	38.2%	36.0%
GP	34.7	30.3	34.8	34.7
General Surgeon	16.1	20.9	33.5	22.3
Internist	46.9	50.4	45.9	43.1*
OB-GYN	54.5	47.7	50.2	53.9
Pediatrician	33.2	26.3	20.2	28.5
Injections	20.5	18.4	27.4	26.7***
GP	25.9	24.7	32.4	28.3
General Surgeon	7.0	7.2	15.0	17.9***
Internist	15.3	16.7	32.3	40.4***
OB-GYN	6.3	4.6	6.4	6.2
Pediatrician	45.4	36.0	40.7	33.4
X-Rays	11.0	13.8	16.1	14.8
GP	11.2	12.1	13.3	11.7
General Surgeon	11.2	16.4	25.9	16.7
Internist	19.7	22.9	19.3	30.8**
OB-GYN	4.8	3.8	6.4	5.8*
Pediatrician	5.5	5.1	6.9	5.7
Office Surgery	3.2	4.7	3.9	4.0
GP	2.8	3.6	4.4	2.8
General Surgeon	7.3	11.8	6.6	6.4**
Internist	0.9	1.2	1.4	6.3***
OB-GYN	5.2	4.4	4.8	3.8
Pediatrician	2.4	2.3	2.9	1.4*

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[a] Ancillary services are measured as percent of patient visits for which a service was ordered.

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

4.1.7 Auxiliary Staff

In our previous work, we found that ELMPs employ more auxiliary personnel, particularly nursing staff. Once we disaggregate by specialty, however, two distinct patterns emerge, as seen in Table 4-13. First, ELMP general surgeons, OB-GYNs, and pediatricians tend to employ more auxiliary staff, especially clerks and technicians. (The differences are significant for OB-GYNs and pediatricians only.) More clerical personnel may be necessary to handle the added administrative work associated with Medicaid reimbursement but then we would have expected all ELMPs to use more clerks. Their higher use of technicians is also surprising, given that ELMPs of all specialties are far less likely to internalize laboratory testing. (Possibly some other types of aides were included in this category; unfortunately, we have no way of knowing for sure.)

Second, although total staff-to-physician ratios are no higher, ELMP internists and GPs use significantly more nursing personnel, both RNs and LPNs. (At the same time, they employ fewer clerks which is somewhat surprising as noted earlier.) Their greater use of nursing staff suggests that these physicians may engage in considerably more medical task delegation than their SMP colleagues. We know that ELMP internists provide significantly more ancillary services to their patients with no appreciable increase in the length of visit. These findings suggest that nursing personnel may be used to perform these services, e.g. administer an injection.

If ELMPs, especially GPs and internists, are delegating tasks appropriately, this should be reflected in increased productivity. The impact of auxiliary staff on physician productivity is compared for SMPs and ELMPs in Table 4-14. Physician productivity is defined as total number of visits per physician hour of patient care. Both SMPs and ELMPs show steadily rising rates of productivity as the number of aides increases; visits per hour increase over 60 percent when the number of staff goes from less than one to three or more. Although ELMPs exhibit slightly higher productivity overall (3.5 visits per hour vs. 3.3 in SMPs), this difference is diluted when we adjust for specialty. ELMP pediatricians and OB-GYNs show the greatest gains

TABLE 4-13

AUXILIARY STAFF BY SIZE OF MEDICAID PRACTICE

	Medicaid Practice Size			
	None	SMP	LMP	ELMP
General Practitioners				
Clerks	0.89	1.28	1.41	0.99**
RNs	0.29	0.34	0.22	0.43
LPNs	0.24	0.28	0.29	0.58***
Technicians	0.28	0.32	0.34	0.22
Nurse Practitioners	0.04	0.07	0.04	0.03
Total	1.69	2.28	2.29	2.23
General Surgeons				
Clerks	1.12	1.04	1.23	1.33
RNs	0.19	0.25	0.22	0.10***
LPNs	0.09	0.11	0.19	0.12
Technicians	0.11	0.11	0.22	0.14
Nurse Practitioners	0.02	0.04	0.02	0.05
Total	1.52	1.56	1.88	1.74
Internists				
Clerks	1.02	1.20	1.29	0.89**
RNs	0.16	0.27	0.24	0.42*
LPNs	0.10	0.15	0.21	0.27**
Technicians	0.26	0.38	0.26	0.17**
Nurse Practitioners	0.04	0.06	0.04	0.07
Total	1.57	2.05	2.05	1.81
OB-GYNs				
Clerks	1.01	1.08	1.11	1.71***
RNs	0.36	0.40	0.39	0.47
LPNs	0.17	0.21	0.27	0.15
Technicians	0.24	0.19	0.09	0.29*
Nurse Practitioners	0.03	0.08	0.04	0.09
Total	1.80	1.96	1.89	2.72***

TABLE 4-13 cont.

AUXILIARY STAFF BY SIZE OF MEDICAID PRACTICE

	Medicaid Practice Size			
	None	SMP	LMP	ELMP
Pediatricians				
Clerks	0.95	0.98	1.08	1.63***
RNs	0.40	0.37	0.44	0.38
LPNs	0.28	0.22	0.34	0.05
Technicians	0.21	0.18	0.11	0.28*
Nurse Practitioners	0.06	0.06	0.06	0.27
Total	1.89	1.81	2.01	2.61***
All Physicians				
Clerks	0.96	1.17	1.29	1.17
RNs	0.28	0.31	0.26	0.38*
LPNs	0.19	0.21	0.25	0.34***
Technicians	0.22	0.26	0.26	0.21
Nurse Practitioners	0.04	0.06	0.04	0.07
Total	1.70	2.01	2.09	2.17

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

TABLE 4-14

IMPACT OF AUXILIARY STAFF ON PHYSICIAN PRODUCTIVITY[a] in ELMPs vs. SMPs

	Number of Aides Per MD									
	0.0-0.9		1.0-1.9		2.0-2.9		3.0+		Total	
	SMP	ELMP	SMP	ELMP	SMP	ELMP	SMP	ELMP	SMP	ELMP
General Practitioners	2.4	1.3	3.5	3.4	3.8	4.4	4.3	4.2	3.6	3.5
General Surgeons	2.4	2.3	2.8	2.0	3.1	2.7	3.9	3.8	2.8	2.5
Internists	2.3	2.0	2.6	2.8	2.9	3.5	3.4	3.3	2.8	2.7
OB-GYNs	3.0	2.8	2.9	2.0	3.2	2.8	3.3	3.6	3.1	3.6
Pediatricians	2.9	2.8	3.3	3.6	3.7	3.2	3.9	5.1	3.4	4.0
All Physicians	2.5	2.1	3.0	3.0	3.4	3.6	4.0	4.0	3.3	3.5

[a] Measured as visits per patient care hour.

relative to SMPs, which is somewhat surprising as their aides are disproportionately clerks rather than nursing personnel. ELMP internists and GPs (who do employ relatively more nurses) appear more productive when they use between one and three aides; above and below these threshholds they do no better or even worse than SMPs. (Caution must be exercised in generalizing too much from these findings, as some cell sizes are very small.)

4.1.8 Geographic Location

Congressional investigations have described Medicaid mills as urban phenomena, located in the ghettos of our large cities particularly in the North East. In fact, ELMPs as a whole are distributed across large, small and non-metropolitan areas in roughly the same proportion as SMPs (see Table 4-15). Our previous work had found that ELMPs were actually more prevalent in small metropolitan areas (less than 1.4 million population), but after adjusting for specialty, we see that only GPs are disproportionately located in these communities. ELMP general surgeons, internists, and OB-GYNs are more likely to be found in non-metropolitan areas compared with SMPs, while ELMP pediatricians are more prevalent in large cities.

Our previous work had also shown an unusually high concentration of ELMPs in the North East, but again this appears to be a GP effect (see Table 4-16). ELMP general surgeons, OB-GYNs and pediatricians are more likely to be located in the Western region of the country compared with SMPs, while ELMP internists are more frequently found in the South. The non-metropolitan, Southern location of ELMP internists could possibly explain their higher incomes as physician competition is limited. But if demand is high relative to supply, we would have expected these physicians to be working more, rather than less.

4.1.9 Practice Organization

In our previous work, ELMPs were found to be solo, unincorporated practices, refuting the notion that these practices are large, incorporated "clinics". Specialty-specific data are generally consistent with these findings. As seen in Table 4-17, ELMP physicians of all specialties are significantly more likely to practice alone rather than in groups. Over four-fifths (83.9%) of ELMPs are solo practices compared with less

TABLE 4-15

GEOGRAPHIC LOCATION BY MEDICAID PRACTICE SIZE

	Medicaid Practice Size											
	None			SMP			LMP			ELMP		
Specialty	Large Metro	Small Metro	Non-Metro	Large Metro	Small Metro	Non-Metro	Large Metro	Small Metro	Non-Metro	Large Metro	Small Metro	Non-Metro
General Practitioners	45.2%	35.0%	19.8%	26.9%	36.0%	37.1%	38.4%	20.5%	41.1%	21.9%	57.8%	20.2%
General Surgeons	46.0	33.2	20.1	39.6	39.3	21.1	38.0	45.9	16.1	44.5	25.5	30.0
Internists	53.9	36.3	9.8	45.8	43.1	11.1	51.6	35.8	12.6	39.6	33.8	26.6
OB-GYNs	54.1	39.6	6.4	39.5	41.7	18.8	33.4	51.9	14.7	37.6	40.5	21.8
Pediatricians	61.2	34.0	4.8	44.7	41.0	14.2	31.7	50.8	17.5	61.3	31.5	7.2
All Physicians	50.1	35.9	13.9	36.4	39.2	24.3	41.1	34.4	24.5	34.7	43.4	21.9

TABLE 4-16

GEOGRAPHIC REGION BY SIZE OF MEDICAID PRACTICE

	None				SMP			
Specialty	N.E.	N.C.	South	West	N.E.	N.C.	South	West
General Practice	20.4	22.4	49.0	8.2	22.4	29.1	25.3	23.2
General Surgery	35.5	20.4	30.7	13.5	29.0	21.9	32.0	17.1
Internal Medicine	44.8	14.1	28.7	12.5	34.4	23.4	22.0	20.2
OB-GYN	27.2	18.3	35.9	18.6	30.9	22.1	32.2	14.8
Pediatrics	26.8	19.3	34.9	19.0	36.4	18.9	32.4	12.3
ALL	28.1	19.6	39.9	12.5	28.5	24.8	27.4	19.4

	LMP				ELMP			
Specialty	N.E.	N.C.	South	West	N.E.	N.C.	South	West
General Practice	8.6	12.8	34.0	44.7	43.3	7.7	27.4	21.6
General Surgery	5.1	11.1	39.6	44.2	35.4	12.1	16.9	35.7
Internal Medicine	14.0	27.4	19.4	39.2	32.9	14.0	31.8	21.4
OB-GYN	28.8	22.8	20.9	27.4	18.0	28.4	22.9	30.7
Pediatrics	17.1	8.8	34.6	39.5	31.3	11.8	20.0	36.8
ALL	12.0	17.3	29.7	41.1	35.8	12.6	25.2	26.4

TABLE 4-17

PRACTICE SIZE AND TYPE BY SIZE OF MEDICAID PRACTICE

	Size of Medicaid Practice			
Practice Size[a]	None	SMP	LMP	ELMP
General Practitioners				
Solo	83.5%	71.4%	66.0%	92.1%***
2-5	15.9	25.7	31.6	7.9
6-9	0.6	3.0	2.4	0.0
General Surgeons				
Solo	79.0	62.8	77.6	88.5***
2-5	20.5	32.2	13.7	10.2
6-9	0.5	5.0	8.7	1.3
Internists				
Solo	72.8	61.7	81.3	85.6***
2-5	27.0	31.4	18.3	14.4
6-9	0.2	6.9	0.4	0.0*
OB-GYNs				
Solo	55.1	45.5	52.3	58.3*
2-5	40.5	51.9	42.1	39.2
6-9	4.4	2.7	5.7	2.5
Pediatricians				
Solo	49.6	48.8	79.4	69.6***
2-5	49.2	47.5	17.7	28.9
6-9	1.1	3.7	2.9	1.6
All Physicians				
Solo	72.3	62.8	72.0	83.9***
2-5	26.3	32.9	24.7	15.4
6-9	1.4	4.3	3.3	0.7***
Incorporated (% yes)				
General Practitioners	24.8	33.1	40.0	14.0***
General Surgeons	36.4	55.0	36.4	48.8
Internists	37.5	52.6	35.2	26.7***
OB-GYNs	55.6	56.6	45.5	58.0
Pediatricians	32.0	30.9	12.4	51.9***
All	34.8	43.9	36.7	31.1***

[a] Column percentages sum to 100% within specialty.

***Significant at .01 confidence level (2-tail test)
**Significant at .05 confidence level
*Significant at .10 confidence level

than two-thirds of SMPs. *Almost no ELMP physicians are found in groups of six or more*.

Some differences in rates of incorporation do emerge, however, after adjustment for specialty. ELMPs run by internists and GPs are significantly less likely to be incorporated compared with SMPs, but ELMP pediatricians are *more* likely to be incorporated. *Overall, however*, *ELMP physicians are significantly less likely to be incorporated, which is again inconsistent with the preconceived notion that "Medicaid physicians" are more financially motivated than their peers*.

4.2 Physicians with Large Medicare-Assigned and Medicaid Caseloads

4.2.1 Sample Definition and Description

In our previous work, we have focussed on physicians who treat large numbers of Medicaid patients. Chapter 2.0's theory predicts, however, that physicians will enter the Medicaid market only after exhausting another public, fixed fee program: Medicare assignment. Thus, between the two programs, some physicians will devote a particularly large portion of their total caseloads to patients for whom they must accept the government fee schedule as payment-in-full. Do the credentials and *modus operandi* of these physicians differ from those of other physicians less dependent on public reimbursement? In particular, are their practices any more likely to resemble "mills"? To answer these questions, we analyzed physicians with large Medicare assigned *and* Medicaid caseloads (LMMPs).

The data base for this analysis was the combined 1975 national and regional samples. A weighting algorithm was used to make the total sample representative of the U.S. as a whole. The total unweighted sample size was 1,840 general practitioners, general surgeons, internists, OB-GYNs, and pediatricians. In addition to the question on percent of Medicaid practice, survey physicians were asked what percent of their Medicare claims they accepted on assignment. This response (weighted by their Medicare caseload) was added to that for Medicaid to obtain the total percent of practice devoted to public, fixed fee patients, or a *joint Medicare-Medicaid participation* rate.

One out of every five patients seen by the average physician is either a Medicaid patient or a Medicare patient taken on assignment. Only nine percent of physicians report that they do not treat any fixed fee patients. There is considerable variation by specialty as shown in Table 4-18. GPs and general surgeons have the highest joint participation rates, and pediatricians the lowest. These differences are consistent with previous work conducted on Medicaid participation and Medicare assignment separately. The low rate for pediatricians is due, of course, to the fact that they treat no Medicare patients, assigned or otherwise.

TABLE 4-18

SIZE DISTRIBUTION OF JOINT MEDICARE-MEDICAID PRACTICES BY SPECIALTY

Specialty	Average Participation Rate	LMMP Cut-off	Medicare-Medicaid Practice Size[a] None	Small	Large
General Practice	23.8%	49.7	10.0%	72.8%	17.2%
General Surgery	26.5	49.0	4.7	78.8	16.5
Internal Medicine	18.9	40.5	5.1	77.7	17.2
OB-GYN	15.9	34.8	13.2	72.9	13.9
Pediatrics	13.1	28.4	14.9	74.1	11.0
All	20.4	41.4	9.0	75.1	15.9

[a] Percentages sum to 100% by row.

TABLE 4-19

MEDICAID AND MEDICARE ASSIGNED PATIENTS AS PERCENT OF TOTAL PRACTICE: SMMPs AND LMMPs

		Percent of Practice: Medicaid	Medicare Assigned	Total
General Practitioner:	SMMP	11.8%	5.3%	17.1%
	LMMP	39.3	26.2	65.5
General Surgeon:	SMMP	10.2	9.6	19.8
	LMMP	23.3	43.3	66.6
Internist:	SMMP	6.3	4.9	11.2
	LMMP	25.1	34.8	59.9
OB-GYN:	SMMP	8.6	3.5	12.1
	LMMP	40.3	10.6	50.9
Pediatrician:	SMMP	10.8	0.0	10.8
	LMMP	46.2	0.3	46.5
All:	SMMP	9.7	5.1	14.8
	LMMP	33.8	27.1	60.9

Large joint Medicare-Medicaid practices (LMMPs) were defined as those in which the percent of practice Medicare assigned and Medicaid exceeded one standard deviation above the mean for that specialty. A GP, for example, was classified as an LMMP if he devoted at least 49.7 percent of his practice to these patients (23.8 + 25.9). The size distribution of Medicare-Medicaid practices is also shown in Table 4-18. About 16 percent of all physicians fall into the LMMP category. For these physicians, public program patients constitute 61 percent of their total caseload (approximately 34% Medicaid and 27% Medicare assigned), as seen in Table 4-19. By contrast, the small Medicare-Medicaid practices average only 15 percent public patients (two-thirds of whom receive Medicaid). The relative Medicaid and Medicare assigned shares of the physician's practice vary by specialty, as would be expected for casemix reasons. The public program caseload of OB-GYNs and pediatricians consists primarily of Medicaid recipients, as these two specialties treat very few elderly patients. Internists and general surgeons who tend to treat an older patient population correspondingly devote a larger share of their public caseload to Medicare assigned patients.

In the tables that follow, we present data for three groups of physicians: (1) those who do not accept Medicaid or Medicare assignment; (2) small Medicare-Medicaid practice, and (3) large Medicare-Medicaid practices. All statistical tests contrast LMMPs with SMMPs.

4.2.2 Physician Credentials and Characteristics

To the extent that Medicare assignment and Medicaid constitute secondary markets for physician services, then physicians serving disproportionately large numbers of these patients (LMMPs) are apt to have fewer credentials than other physicians. Table 4-20 provides support for this hypothesis, but primarily only for OB-GYNs. Only one-half of OB-GYNs with LMMPs are board-certified in their specialty (53.1%), compared with over three-fourths of those with SMMPs. Almost three times as many FMGs are found in these LMMPs as in SMMPs; one out of every five OB-GYNs with a large Medicare-Medicaid practice was trained outside the U.S. Using the more restrictive definition of Third World FMG, large OB-GYN practices still include three times as many FMGs: 12.4 percent

TABLE 4-20

PHYSICIAN CREDENTIALS BY SIZE OF JOINT MEDICARE-MEDICAID PRACTICE (%)

	Medicare-Medicaid Practice Size		
	None	Small	Large
Board-Certification			
General Practitioner	4.5	7.1	3.5
General Surgeon	63.1	65.0	76.2
Internist	35.8	46.9	40.2
OB-GYN	58.9	77.3	53.1**
Pediatrician	69.2	75.6	81.4
All	37.4	44.2	37.5
Foreign Medical Graduate			
General Practitioner	4.1	10.0	9.5
General Surgeon	33.6	14.4	15.7
Internist	16.7	12.6	15.9
OB-GYN	7.6	7.6	19.1**
Pediatrician	0.0	14.1	25.2
All	8.2	11.5	14.6
Third World FMG			
General Practitioner	3.1	6.4	6.3
General Surgeon	33.6	5.5	15.7**
Internist	11.7	6.9	11.0
OB-GYN	4.6	4.5	12.4*
Pediatrician	0.0	10.6	17.0
All	6.5	6.6	10.7**
Medical School Faculty			
General Practitioner	0.0	1.6	0.2
General Surgeon	0.0	12.3	15.6
Internist	19.8	17.7	16.1
OB-GYN	24.4	16.0	17.3
Pediatrician	23.5	15.6	28.3
All	12.2	10.9	11.2

**Significant at five percent level.
*Significant at ten percent level.

versus 4.5 percent. Although general surgeons with LMMPs are also more likely to be Third World FMGs than are those with SMMPs, there are no other significant differences in physician credentials between small and large joint Medicare-Medicaid practices.

The pronounced difference in credentials between OB-GYNs in SMMPs and LMMPs is particularly interesting when we recall that OB-GYNs have the highest Medicaid nonparticipation rate of any specialty except psychiatry. (See Tables 4-2 and 5-2 of this report.) Earlier we suggested that there may be reasons particularly unique to OB-GYNs that discourage Medicaid participation, despite the potentially high demand of eligible AFDC women; e.g., particularly low reimbursement rates for prenatal care and delivery, low realized demand, etc. Whatever the reasons, it is definitely the less qualified OB-GYNs who decide to devote a large percentage of their caseload to Medicaid (and assigned Medicare) patients. We see below in Table 4-21 that these OB-GYNs also share some distinctly different personal characteristics from other OB-GYNs; they are significantly more likely to be black and to be women.

Younger physicians appear more willing to see large numbers of public patients than do older physicians. GPs, general surgeons, and internists with LMMPs are significantly more likely to be under 40 years of age and less likely to be over 60, compared with their colleagues in SMMPs. These younger physicians may be willing to fill up their caseloads with low marginal revenue patients while building up their private practice. They may also hold more liberal political attitudes which encourages their participation. We test the latter empirically in Chapter 7.3.

Physicians with large Medicaid-Medicare practices are also more likely to be "minority" physicians, i.e., blacks and women. The differences are most marked for the two specialties who primarily serve only one of the two public programs: OB-GYNs and pediatricians. One out of every ten OB-GYNs and pediatricians running an LMMP is black, compared with one out of a hundred (or less) in an SMMP. Twice as many women are found in LMMPs (9.2% of OB-GYNs, 18.2% of pediatricians) as in SMMPs (4.5% and 9%, respectively). Why are women and blacks so much more likely to serve public program patients? There are several possible explanations. First,

TABLE 4-21

PERSONAL PHYSICIAN CHARACTERISTICS BY SIZE OF JOINT MEDICARE-MEDICAID PRACTICE (%)

	Medicare-Medicaid Practice Size		
	None	Small	Large
Age < 40 years			
General Practitioner	3.9	4.3	11.1**
General Surgeon	10.0	9.7	14.2
Internist	0.8	14.4	29.5**
OB-GYN	10.2	15.2	18.6
Pediatrician	6.3	23.8	23.3
All	5.8	11.4	18.1**
Age ≥ 60 years			
General Practitioner	37.7	34.6	31.8
General Surgeon	12.7	29.0	11.5**
Internist	43.6	20.0	8.9**
OB-GYN	41.6	16.5	10.6
Pediatrician	22.6	14.2	6.0
All	34.2	25.2	18.0**
Race - Black			
General Practitioner	2.5	2.0	3.2
General Surgeon	0.0	1.8	2.9
Internist	0.0	0.2	2.0*
OB-GYN	1.5	1.3	12.1***
Pediatrician	0.0	0.1	10.4***
All	1.3	1.2	4.6***
Sex - Female			
General Practitioner	6.2	2.3	4.8
General Surgeon	12.0	1.5	1.0
Internist	7.6	5.7	5.5
OB-GYN	20.4	4.5	9.2***
Pediatrician	5.3	9.0	18.2***
All	9.7	4.0	6.0***

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

if women and black physicians tend to be less qualified on average, then they are more likely to enter the secondary public market. Even after adjusting for specialty differences, black and women physicians are less likely to be board-certified. (See Kehrer, 1976 and Chapter 9.0 of this report.) *Second*, black and women physicians may be more likely to hold social/political attitudes encouraging treatment of the poor. *Third*, discrimination on the part of either referring physicians or patients may drive blacks and women in disproportionate numbers into the lower paying public markets. Kehrer (1976) found, for example, that female physicians earned less per hour than male physicians even after holding board-certification and other credentials constant. Increased competition also appeared to affect women physicians disproportionately more than men physicians. In our econometric analysis (Chapter 7.3), we will examine the impact of being "black" or "female" on joint participation, holding all of these other factors constant.

4.2.3 Caseload and Work Effort

GPs in LMMPs make significantly more visits per week than do those in SMMPs, about 21 percent more on average (Table 4-22), *primarily due to increased office activity*. *Total caseloads for specialists in LMMPs are not any larger than those in SMMPs*, but there are some interesting variations by *type* of visit. *LMMP general surgeons see almost three times as many ER/clinic patients per week as do their colleagues with SMMPs*, for example, suggesting that many of their public patients may be seen in traditional institutional settings. OB-GYNs with LMMPs, on the other hand, make significantly fewer inpatient visits, implying a very different practice style from that of OB-GYNs with small Medicare-Medicaid practices. Most interesting, *all LMMP physicians (except pediatricians) provide more visits to a patient group all too often ignored: nursing home patients*. LMMPs average 6 nursing home visits per week, versus only 3 for SMMPs. *LMMP pediatricians, moreover, provide significantly more house calls.*

All LMMP physicians (except pediatricians) work longer hours than those in SMMPs, but the difference is significant only for internists. LMMP internists spend over 4 hours more per week providing patient care.

TABLE 4-22

CASELOAD AND WORK EFFORT BY SIZE OF MEDICARE-MEDICAID PRACTICE

	Size of Medicare-Medicaid Practice		
	None	Small	Large
General Practitioner			
Length of Office Visit	23.3	17.5	18.4
Total Hours	52.7	53.9	55.5
Total Visits	199.9	205.4	248.8**
Office Visits	169.2	157.1	198.8***
Inpatient Visits	19.6	34.9	32.5
ER/Clinic Visits	5.1	4.4	4.8
Operations	1.4	1.7	1.0**
Nursing Home Visits	1.2	5.1	8.9**
House Calls	3.2	2.3	2.6
General Surgeon			
Length of Office Visit	20.4	22.8	16.1**
Total Hours	49.3	57.5	62.4
Total Visits	109.9	164.1	165.6
Office Visits	50.9	64.7	61.2
Inpatient Visits	50.2	81.2	69.1
ER/Clinic Visits	1.9	6.9	20.2***
Operations	5.9	10.3	11.7
Nursing Home Visits	0.0	0.7	3.2**
House Calls	0.1	0.3	0.2
Internist			
Length of Office Visit	28.6	25.0	31.1**
Total Hours	54.1	50.5	54.9**
Total Visits	130.3	151.6	161.8
Office Visits	76.4	83.9	82.4
Inpatient Visits	45.3	59.7	67.6
ER/Clinic Visits	4.2	2.5	3.3
Operations	0.0	0.1	0.0
Nursing Home Visits	2.4	4.4	7.4**
House Calls	1.9	1.0	1.0

TABLE 4-22 cont.

CASELOAD AND WORK EFFORT BY SIZE OF MEDICARE-MEDICAID PRACTICE

	Size of Medicare-Medicaid Practice		
	None	Small	Large
OB-GYN			
Length of Office Visit	19.7	17.4	19.2
Total Hours	50.3	57.4	59.6
Total Visits	149.3	197.3	176.1
Office Visits	101.3	114.6	112.5
Inpatient Visits	35.1	62.4	41.3*
ER/Clinic Visits	6.3	9.0	11.7
Operations	6.2	11.3	9.1
Nursing Home Visits	0.2	0.0	1.6**
House Calls	0.1	0.0	0.1
Pediatrician			
Length of Office Visit	13.8	16.4	18.2
Total Hours	46.1	52.3	47.9
Total Visits	195.8	214.7	204.0
Office Visits	170.5	160.2	166.1
Inpatient Visits	21.7	43.1	30.6
ER/Clinic Visits	2.5	10.3	5.4
Operations	0.2	0.7	0.3
Nursing Home Visits	0.2	0.3	0.0
House Calls	0.6	0.1	1.7***
All Physicians			
Length of Office Visit	21.1	20.0	21.2
Total Hours	50.8	53.9	56.5**
Total Visits	171.0	185.4	199.7**
Office Visits	133.2	118.4	133.3**
Inpatient Visits	29.2	53.5	48.3
ER/Clinic Visits	3.7	5.5	7.2**
Operations	2.4	4.1	3.6
Nursing Home Visits	0.8	2.9	5.9**
House Calls	1.6	1.1	1.4**

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

These longer hours are not spent providing additional visits but rather spending more time with each patient. The LMMP internist devotes 24 percent more time to his office patients, or about 6 minutes more on average, compared with his SMMP colleague. General surgeons with LMMPs, on the other hand, actually spend less time with each office patient than those with SMMPs. There are no significant differences in lengths of visit for the other specialties, although the trend is definitely toward longer visits in LMMPs. If Medicaid and Medicare assigned patients tend to be sicker than other patients (as we might reasonably expect), this could well explain these longer visits, but the shorter visits for general surgeons remain a puzzle.

4.2.4 Physician Earnings

One of the biggest concerns of policy makers is that physicians participating in the Medicare and Medicaid programs may be making extraordinary incomes. Our previous work with large Medicaid practices showed that this was not the case (Mitchell and Cromwell, 1980). An equal concern, however, is whether LMMP physicians may be unfairly penalized for concentrating on these public program patients. Table 4-23 suggests that while LMMP physicians generally report net incomes somewhat lower than those of SMMP physicians of the same specialty, the difference is significant only for OB-GYNs. OB-GYNs with large Medicare-Medicaid practices earn over $10,000 less than their SMMP colleagues. Adjustment of incomes for work effort removes most of the earnings differential between LMMPs and SMMPs, but a disproportionately large gap remains for OB-GYNs (although it is no longer significant).

From Section 4.2.2, we know that there may be both legitimate (fewer) credentials) and illegitimate (more discrimination) reasons for the lower earnings of LMMP physicians, particularly OB-GYNs. In order to test whether there is significant illegitimate (unexplained) variation in physician incomes, adjusted hourly earnings of all physicians were regressed on physician credentials and other exogenous variables that might affect returns to labor (the same specification described in Section 4.1 above). If LMMP physicians are earning less than might be expected from their background and training or from economic factors, then LMMP residuals from this regression should be negative. The residuals for LMMP physicians

TABLE 4-23

PHYSICIAN NET INCOMES (IMPUTED HOURLY WAGES) BY SIZE OF JOINT MEDICARE-MEDICAID PRACTICE[a]

	Medicare-Medicaid Practice Size		
	None	Small	Large
General Practice	$48,159 ($22.00)	$49,775 ($20.12)	$45,638 ($19.48)
General Surgery	60,781 (31.72)	64,548 (25.51)	65,255 (23.56)
Internal Medicine	46,284 (19.72)	56,370 (24.82)	55,323 (24.25)
OB-GYN	63,555 (29.96)	67,953 (26.93)	57,463* (24.03)
Pediatrics	51,635 (29.05)	56,698 (23.49)	51,386 (22.14)
All	52,910 (25.58)	57,221 (23.49)	55,354** (22.14)

[a] Adjusted for geographic cost-of-living differences (1975 dollars).

**Significant at five percent level.
*Significant at ten percent level.

were negative, but not significantly different from zero at conventional levels (t=1.2).

One reason for lower incomes among LMMPs are the lower fees they receive from Medicare and Medicaid. Table 4-24 presents the physician's usual fee for a follow-up office visit, and the Medicare prevailing charge, and the Medicaid fee for the same procedure. (As the prevailing charge is the maximum allowed charge under Medicare, rather than the customary charge, some physicians may actually receive somewhat less.) The fee hierarchy can be clearly seen; the physician's usual fee is always highest, followed by the Medicare prevailing, and lastly the Medicaid fee. Usual fees for LMMPs are generally lower than those for SMMP physicians, a finding consistent with our two market demand model described in Chapter 2. We had also hypothesized that participation levels would be higher where Medicare and Medicaid fees were relatively higher, but there are no apparent differences in mean fees between LMMPs and SMMPs. Other factors are not held constant here, however, and we will test this empirically in Chapter 7.3.

4.2.5 Practice Location

Table 4-25 presents the size of Medicare-Medicaid practice by region of the country and SMSA-nonSMSA. The regional differences are particularly striking. LMMP physicians are much more likely to be located in the North East compared with SMMPs (38% vs 27%) and less likely to be in the North Central and Southern regions of the country. One out of every five practices in the North East is a large Medicare-Medicaid practice. By contrast, one out of every seven practices in the South treats no public patients whatsoever. These differences may reflect regional variations in political attitudes or variations in Medicaid-Medicare program characteristics.

Although physicians treating Medicare-Medicaid patients are twice as likely to be located in rural areas as are nonparticipants, there are no differences between SMMPs and LMMPs. Over one-quarter (27-28%) of these public program practices are found in non-SMSAs.

4.2.6 Political Attitudes

Previous work has shown that political attitudes influence both the assignment and the Medicaid participation decisions, above and beyond

TABLE 4-24

USUAL, MEDICARE, AND MEDICAID FEES[a] FOR A FOLLOW-UP OFFICE VISIT BY SIZE OF MEDICARE-MEDICAID PRACTICE

	Medicare-Medicaid Practice Size		
	None	Small	Large
General Practitioner			
Usual	$10.39	$10.12	$10.39
Medicare	9.32	8.82	9.16
Medicaid	7.16	7.36	7.55
General Surgeon			
Usual	10.16	12.73	11.68
Medicare	11.58	10.76	11.22
Medicaid	8.63	8.25	8.16
Internist			
Usual	13.22	13.49	12.30
Medicare	11.58	10.76	11.22
Medicaid	8.48	8.28	8.24
OB-GYN			
Usual	14.77	14.38	13.75
Medicare	11.58	10.76	11.22
Medicaid	7.96	8.76	8.27
Pediatrician			
Usual	10.94	11.14	11.65
Medicare	11.58	10.76	11.22
Medicaid	8.34	8.30	8.72
All			
Usual	11.77	12.05	11.61
Medicare	10.72	10.11	10.45
Medicaid	7.85	8.01	8.01

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[a] Usual and Medicaid fees are based on the physician's self-report. The Medicare fee is the prevailing charge for the physician's reasonable charge locality based on whether he is a GP or specialist. No distinction was made between type of specialist.

TABLE 4-25

GEOGRAPHIC LOCATION BY SIZE OF JOINT MEDICARE-MEDICAID PRACTICE (percentage distribution)[a]

	Medicare-Medicaid Practice Size		
	None	Small	Large
North East	25.6/ 8.0	27.2/70.8	38.2/21.1
North Central	22.4/ 9.7	21.6/77.9	16.2/12.4
South	49.4/14.0	31.1/73.0	26.4/13.0
West	2.6/ 1.3	20.1/82.1	19.2/16.6
SMSA	86.3/10.7	71.5/73.5	72.6/15.8
Non-SMSA	13.7/ 4.6	28.5/79.2	27.4/16.1

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[a] Numbers to the left of the slash (/) sum to 100% by column; numbers to the right sum by row.

traditional economic variables (Mitchell and Cromwell, 1981; Sloan, Cromwell, Mitchell, 1978). Not surprisingly, we also observe a strong association between these attitudes and the joint participation decision. Each physician was asked whether he agreed or disagreed with two different statements displayed in Table 4-26.* Physicians with LMMPs were much more likely than SMMP physicians to strongly agree that health care is a right, as measured by responses to the first statement ("it is the responsibility of society..."). The majority of all physicians felt that there were too many controls on the medical profession, but LMMP physicians were less likely to strongly agree.

4.2.7 Practice Characteristics

LMMP physicians tend to employ fewer auxiliary staff than SMMP physicians, particularly RNs, but these differences are generally not significant. (See Table 4-27.) In absolute terms, the differences are also fairly small. LMMPs use an average 1.4 aides per physician, for example, compared with 1.6 for SMMPs (and only 1.3 for nonparticipants). In the case of OB-GYNs, furthermore, LMMPs appear to have substituted (at least in part) nurse practitioners for RNs.

For the most part, LMMP physicians are solo practitioners who have not learned (or eschewed) the financial value of incorporation (Table 4-28). Compared with SMMPs, they are significantly more likely to practice alone rather than in groups. Again, we note an exception for OB-GYNs as they are more likely to practice in groups of 2-5 physicians. LMMPs also tend to not incorporate, but this characteristic is significant only for GPs and general surgeons.

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*These two questions were asked in the national survey only. The unweighted sample size on which these responses are based is 903.

TABLE 4-26

PHYSICIAN POLITICAL ATTITUDES BY SIZE OF MEDICARE-MEDICAID PRACTICE (percentage distribution)[a]

Political Attitude by Medicare-Medicaid Practice	Strongly Agree	Agree Somewhat	Disagree Somewhat	Strongly Disagree
"It is the responsibility of society, through its government, to provide everyone with the best available medical care, whether he can afford it or not."				
None	18.7%	26.7%	14.9%	39.7%
Small	20.4	23.0	22.7	33.9
Large	29.6	35.2	15.0	20.2
"There are too many controls on the medical profession that interfere with taking care of patients."				
None	74.5	16.0	6.6	2.9
Small	62.2	21.5	12.8	3.6
Large	55.0	21.9	18.0	5.1

[a] Rows sum to 100%.

TABLE 4-27

AUXILIARY STAFF BY SIZE OF MEDICARE-MEDICAID PRACTICE

	Medicare-Medicaid Practice Size		
	None	Small	Large
General Practitioner			
Clerks	0.86	1.14	1.05
RNs	0.07	0.22	0.06**
LPNs	0.12	0.18	0.25
Technicians	0.05	0.08	0.13
Nurse Practitioners	0.07	0.09	0.08
Other	0.04	0.05	0.13**
Total	1.13	1.77	1.70
General Surgeon			
Clerks	0.69	0.93	0.92
RNs	0.10	0.17	0.11
LPNs	0.19	0.06	0.04
Technicians	0.15	0.03	0.01
Nurse Practitioners	0.12	0.05	0.05
Other	0.02	0.03	0.02
Total	1.27	1.27	1.15
Internist			
Clerks	0.76	0.92	0.97
RNs	0.13	0.12	0.10
LPNs	0.05	0.12	0.04**
Technicians	0.23	0.23	0.21
Nurse Practitioners	0.0	0.04	0.02
Other	0.12	0.03	0.02
Total	1.30	1.46	1.36
OB-GYN			
Clerks	0.83	0.93	1.01
RNs	0.19	0.26	0.11**
LPNs	0.02	0.21	0.12
Technicians	0.02	0.02	0.01
Nurse Practitioners	0.07	0.01	0.05**
Other	0.02	0.05	0.01
Total	1.16	1.48	1.31

TABLE 4-27 cont.

AUXILIARY STAFF BY SIZE OF MEDICARE-MEDICAID PRACTICE

	Medicare-Medicaid Practice Size		
	None	**Small**	Large
Pediatrician			
Clerks	0.80	1.01	0.84
RNs	0.36	0.24	0.18
LPNs	0.09	0.27	0.01**
Technicians	0.09	0.06	0.01
Nurse Practitioners	0.04	0.03	0.01
Other	0.14	0.04	0.01
Total	1.51	1.64	1.08*
All Physicians			
Clerks	0.81	1.01	0.99
RNs	0.16	0.20	0.10***
LPNs	0.09	0.16	0.13
Technicians	0.08	0.10	0.10
Nurse Practitioners	0.06	0.05	0.05
Other	0.07	0.04	0.06*
Total	1.27	1.56	1.42*

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

TABLE 4-28

PRACTICE SIZE AND TYPE BY SIZE OF JOINT MEDICARE-MEDICAID PRACTICE

Practice Size	Medicare-Medicaid Practice Size		
	None	Small	Large
General Practice			
Solo	75.7	83.6	86.4
2-5 MDs	13.8	15.9	13.1
6-14 MDs	10.5	0.5	0.5
General Surgery			
Solo	75.9	64.2	79.4**
2-5 MDs	24.1	32.9	20.0*
6-14 MDs	0.0	2.9	0.6
Internal Medicine			
Solo	76.3	56.4	64.8
2-5 MDs	23.7	28.7	33.0
6-14 MDs	0.0	14.9	2.1**
OB-GYN			
Solo	71.1	60.3	44.3*
2-5 MDs	28.9	34.2	55.7**
6-14 MDs	0.0	5.5	0.0
Pediatrics			
Solo	58.8	44.9	70.7**
2-5 MDs	41.2	46.0	29.3
6-14 MDs	0.0	9.0	0.0
All Physicians			
Solo	71.6	66.1	73.4**
2-5 MDs	24.4	27.9	25.8
6-14 MDs	4.0	6.0	0.8**
Incorporated (% yes)			
General Practitioners	4.5	16.8	8.2**
General Surgeons	37.7	48.4	23.6**
Internists	12.1	35.5	39.4
OB-GYNs	37.3	52.6	46.5
Pediatricians	43.7	25.8	25.0
All	22.8	32.7	24.7**

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

5.0 DESCRIPTIVE ANALYSIS OF LARGE MEDICAID PRACTICES: SECONDARY SPECIALISTS

One limitation of our earlier LMP work on secondary specialists was inadequate sample sizes for specialty-specific analysis. Combining two years worth of data from the HCFA-NORC physician surveys yielded enough observations to analyze large Medicaid practices within each of the specialties separately, and still allow findings to be tested for statistical significance. The enlarged data set also supported the investigation of many questions raised by our previous study, and to build upon our knowledge of secondary specialists' participation in the Medicaid program.

Secondary specialists' Medicaid participation was investigated using an unweighted sample of 3,215 physicians from ten specialties including psychiatry. Given differences in practice style and inputs, locus of care, and casemix across specialties which may affect physicians' decisions to treat Medicaid patients, the secondary specialists were grouped into medical, surgical, and psychiatric subsamples as shown below:

Medical Specialists: allergists, cardiologists, dermatologists, and gastroenterologists;

Surgical Specialists: neurosurgeons, ophthalmologists, orthopedic surgeons, otolaryngologists and urologists; and

Psychiatrists: both child and adult psychiatrists.

In Sections 5.1 and 5.2 we examine specialists' overall participation in Medicaid. The following six sections, 5.3 through 5.9, contain descriptive findings on medical and surgical specialists with large Medicaid caseloads, comparing their credentials; incomes; caseloads; ancillary utilization; auxiliary staff; practice costs, revenues and markups; and practice characteristics (location, size and organization) with those of other specialists. Finally, Section 5.10 focusses exclusively on large Medicaid practice psychiatrists.

5.1 Medicaid Participation

5.1.1 Size Distribution of Medicaid Practices

The size distribution of Medicaid practices is presented in Table 5-1 for medical and surgical specialists, and psychiatrists. The percentage of Medicaid patients in a practice, grouped into deciles, are represented by the rows of the table, beginning with nonparticipants in the program (i.e., no Medicaid patients at all). The numbers in each of the three columns refer to the percentage of physicians in each Medicaid practice size class; all columns sum to 100 percent. For example, 52.7 percent of all medical specialists devote between 1 and 10 percent of their practices to the treatment of Medicaid recipients.

According to Table 5-1, nonparticipation rates of medical specialists are notably higher than those of their surgical colleagues (26.6% compared to 17.1%). Psychiatrists are the least likely of all the secondary specialists to participate in Medicaid; 42.2 percent of psychiatrists see no Medicaid patients at all. Restrictions on Medicaid coverage for psychiatric services adopted by many states undoubtedly provide some explanation for their behavior. Limited demand by Medicaid beneficiaries, who are largely children and the elderly who seldom utilize psychiatric services, may further explain low participation rates. Because of programmatic constraints, as well as a practice style which differentiates them from other specialists (e.g., provision of fewer visits of longer duration, little ancillary utilization, few auxiliary personnel, etc.), psychiatrists will be analyzed separately in Section 5.10. (They are included throughout the remainder of Section 5.1, however.)

TABLE 5-1

SIZE DISTRIBUTION OF MEDICAID PRACTICES: MEDICAL AND SURGICAL SPECIALISTS, AND PSYCHIATRISTS

Percent Medicaid Patients	Medical Specialists	Surgical Specialists	Psychiatrists
-0-	26.6%	17.1%	42.2%
1-10	52.7	47.8	38.0
11-20	14.6	17.4	8.4
21-30	3.2	10.5	5.6
31-40	1.9	4.0	2.4
41-50	0.6	1.1	1.9
51-60	0.2	1.0	0.5
61-70	0.0	0.3	0.2
71-80	0.2	0.7	0.7
81-90	0.0	0.0	0.1
91-100	0.0	0.0	0.0

Of those specialists who do participate in the program, the majority have fairly small Medicaid caseloads. Approximately half of the medical and surgical specialists, and 38 percent of psychiatrists, devote less than ten percent of their practices to Medicaid patients. A sizeable proportion of specialists, particularly in the surgical specialties, have between ten and thirty percent Medicaid patients. Practices with Medicaid caseloads of more than thirty percent are relatively few (accounting for 2.9%, 7.1% and 7.6% of the medical, surgical and psychiatric groups, respectively).

5.1.2 Average Participation Rates

Because of the additional years of professional training required for specialization, secondary specialists can (and do) command much higher fees for their services than primary care physicians. Human capital theory would hypothesize that all specialists, regardless of specialty type, would find Medicaid fees schedules relatively less attractive and hence be less likely to participate in the program. According to Table 5-2, presenting average Medicaid participation rates by specialty, secondary specialists do have slightly lower participation rates than their primary care colleagues, but not nearly as low as might have been expected. The mean participation rate for secondary specialists as a group is 10.4 percent compared to 12.7 percent in primary care. Overall access to specialized physician care by Medicaid recipients, a primary concern of policy makers, actually seems quite good.

Upon close examination of Table 5-2, we find considerable variation in Medicaid participation by specialty. Otolaryngologists (ENTs), for instance, devote almost 14 percent of their practice to Medicaid patients on average, compared to only 7 percent for cardiologists. (Although it is unclear why almost one-third of cardiologists choose not to participate in Medicaid, their decision effectively lowers average participation rates for the specialty as a whole.) In fact,

TABLE 5-2

MEDICAID PRACTICE SIZE AND PARTICIPATION BY SPECIALTY: SECONDARY SPECIALISTS

	Medicaid Practice Size[a]				
Specialty	None	Small	Large[b]	Average Participation Rate	LMP Cutoff
Medical Specialties	26.6%	60.0%	13.4%	8.8%	21.0%
Allergy	22.9	62.3	14.8	7.8	18.5
Cardiology	31.9	56.2	11.9	6.9	17.6
Dermatology	27.1	58.7	14.2	11.2	25.7
Gastroenterology	18.9	62.8	18.4	9.2	19.6
Surgical Specialties	17.1	69.4	13.4	12.2	25.7
Neurosurgery	15.2	72.5	12.3	10.6	20.2
Ophthalmology	18.0	68.6	13.4	13.2	28.1
Orthopedic Surgery	18.6	69.3	12.1	9.8	20.7
Otolaryngology	16.3	67.2	16.5	13.9	28.3
Urology	11.1	76.4	12.5	13.2	27.2
Psychiatry	42.2	46.5	11.3	8.0	21.2

[a] Percentages may not sum to 100% due to rounding.

[b] Large Medicaid practices are defined as one standard deviation above the specialty-specific mean participation rate.

the mean Medicaid caseload of all surgical specialists as a group (12.2% of practice) is significantly higher than that of medical specialists (8.8%). How can we account for this striking difference in Medicaid behavior between surgical and medical specialists? There are at least four (not mutually exclusive) explanations: (1) casemix variation; (2) differences in reimbursement levels; (3) physician competition; and (4) public pressure in institutional settings.

First, and perhaps most important, program participation is undoubtedly influenced by Medicaid casemix, i.e., patient demand.* Specifically the demand by Medicaid beneficiaries is skewed toward children and the elderly who generate 18.9 percent and 38.0 percent of total expenditures, respectively (MMMI, 1979). Three of the specialties with particularly high Medicaid participation rates are surgeons who treat these age-groups: (1) otolaryngologists; (2) ophthalmologists; and (3) urologists. A large proportion of otolaryngologists' practices, for example, are devoted to otitis media, tonsillitis, and other common childhood diseases (NCHS, 1978d), while ophthalmologists and urologists report that the elderly constitute a large proportion of their patient population (NCHS, 1978c,g). Increased demand due to casemix difference can only be a partial explanation, however; cardiologists spend 40 percent of their office visits with patients age 65 and older (NCHS, 1978g), but have below-average Medicaid participation rates.

The issue of casemix, and the demographic composition of the Medicaid population, clearly has important implications for Medicaid participation more generally. Variations in participation rates within the medical and surgical groupings, for example, reflect the influence of Medicaid casemix. Dermatologists provide a case in point. More than 40% of dermatologists' patients are under 25 years of age (NCHS, 1978e), with acne being the most common patient problem (accounting for almost

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*Casemix is used here in the broadest sense of the word, to describe the demographic mix of Medicaid patients seeking specialists' care. Diagnostic casemix, in its usual sense, refers to disease mix, which clearly varies not only across specialties but within specialty. While holding specialty constant provides a first step in controlling for casemix variation, within-specialty differences may remain.

one-quarter of all visits to dermatologists). Accordingly, dermatologists have a fairly high participation rate relative to other medical specialists, 11.2 percent.

Second, Medicaid fee schedules may be relatively more generous in their reimbursement of surgical procedures. Operations are discrete procedures, and relative complexity can be easily captured by such measures as the California Relative Value Scale. As a result, reimbursement rates may be more directly tied to the level of physician effort required to perform the procedure. Non-surgical services, on the other hand, such as a diagnostic work-up during an office visit, tend to be more heterogeneous and vary considerably as a function of physician specialty and other characteristics.

Third, the relatively greater supply of surgical specialists may encourage entry into the Medicaid market through increased competition. The five surgical specialties included here constitute 13.5 percent of all office-based physicians nationwide, as compared with 5.4 percent for medical specialists (AMA, 1977). Surgical specialists are also more evenly distributed across states and across urban-rural areas than are their medical colleagues, facilitating access to their services (Morrow, 1977).

Fourth, surgical specialists are more likely to see patients outside their offices, in public settings such as hospitals, and more often on an emergency basis. Under these conditions, surgeons may find it more difficult to refuse acceptance of a Medicaid patient. Hospital administrators and service chiefs may also have more leverage in encouraging Medicaid participation by surgeons through control of operating room schedules and privileges.

5.1.3 Definition of Large Medicaid Practices

Given the variation in participation by specialty, a decision was made to redefine (as distinct from our previous work) small and large Medicaid practices on a specialty-specific basis. Throughout this study, LMPs will be defined as those practices in which the percent of patients Medicaid exceeds one standard deviation above the mean percentage of Medicaid patients for that specialty. Physicians seeing any Medicaid patients, but fewer than LMPs, will constitute small Medicaid practices, with nonparticipants comprising the residual category. Using a standard deviation above the mean as the cutoff point for an LMP has two distinct advantages to choosing a constant cutoff for the entire sample: (1) by taking into account the mean percentage of Medicaid patients in a practice for each specialty, practices identified as LMPs are being measured relative to that specialty's norm; and (2) variations across specialties are taken into consideration. In addition, this LMP definition assures adequate sample sizes for statistical testing.

Unweighted sample sizes of physicians in the three Medicaid practice groups are presented by specialty in Table 5-3. Percent distributions should not be calculated from these cell sizes, however, as the observations are unweighted. Weighted distributions on which all analytic work is based can be seen in Table 5-2. Simply summing the mean participation rate and standard deviation within a specialty will yield the definition of an LMP for that particular specialty. For example, a large Medicaid practice for allergists would be defined as any allergist whose Medicaid caseload exceeds 18.5% of his practice (7.8 + 10.7). By contrast, at least 38.1% of an ophthalmologist's practice would have to be Medicaid before he would be considered an LMP physician.

Analysis of secondary specialists' participation in Medicaid consists of both descriptive and multivariate techniques. Multivariate analysis is presented in Chapter 7; this chapter focusses exclusively on descriptive findings. In the following sections, the personal and practice characteristics of LMP specialists are compared to those of

TABLE 5-3

UNWEIGHTED SAMPLES BY MEDICAID PRACTICE SIZE: SECONDARY SPECIALISTS

Specialty	None	Small	Large	Total
	Medicaid Practice Size			
Medical Specialties	219	531	130	880
Allergy	70	147	41	258
Cardiology	52	120	32	204
Dermatology	63	161	26	250
Gastroenterology	34	103	31	168
Surgical Specialties	224	1008	179	1411
Neurosurgery	30	175	34	239
Ophthalmology	67	215	45	327
Orthopedic Surgery	47	195	37	279
Otolaryngology	54	211	40	305
Urology	26	212	23	261
Psychiatry	374	413	137	924

their SMP and nonparticipating colleagues. These characteristics include physician incomes, credentials, work effort and caseload, use of auxiliary personnel and ancillary services, practice size and location, and geographic location. Before investigating any of these issues, however, we begin by looking at the distribution of Medicaid patients across specialists' practices.

5.2 Size Distribution of Medicaid Patients Across Physician Practices

Large Medicaid practices might be of less concern to policy makers if only a small proportion of all Medicaid patients are being treated in them. The distribution of Medicaid patients across physician practices becomes an important question, then, in assessing the role of LMPs in providing medical care to the nation's poor.

Lorenz curves, shown in Figures 5-1 and 5-2 for medical and surgical specialists, respectively, were constructed from patient mix and caseload data to estimate the extent of maldistribution of public patients among physicians. Along the ordinate is plotted the cumulative percentage of physician practices (calculated in vingtiles); along the abscissa, the cumulative percentage of Medicaid visits. Lorenz curves for Medicare and Blue Shield visits are provided for comparison purposes. If Medicaid patients were equally distributed across all physicians, the Lorenz curve would approximate the diagonal line in the figures, and all practices would be SMPs. Curves falling beneath the diagonal indicate less than perfect equality, as measured by the area between the two. Hence, the greater the departure of the Lorenz curve from the diagonal, the greater the inequality of distribution.

It is evident from the two curves that Medicaid patients are severely maldistributed among secondary specialists. Maldistribution is most pronounced in the medical specialties, evidenced by the larger area between the curve and diagonal. Three-quarters of medical specialists supply only one-fifth of all Medicaid visits made to these specialists. In the surgical specialties, the situation is not much better -- a comparable proportion of surgical specialists (3/4) provide merely one-third of the visits by Medicaid patients.

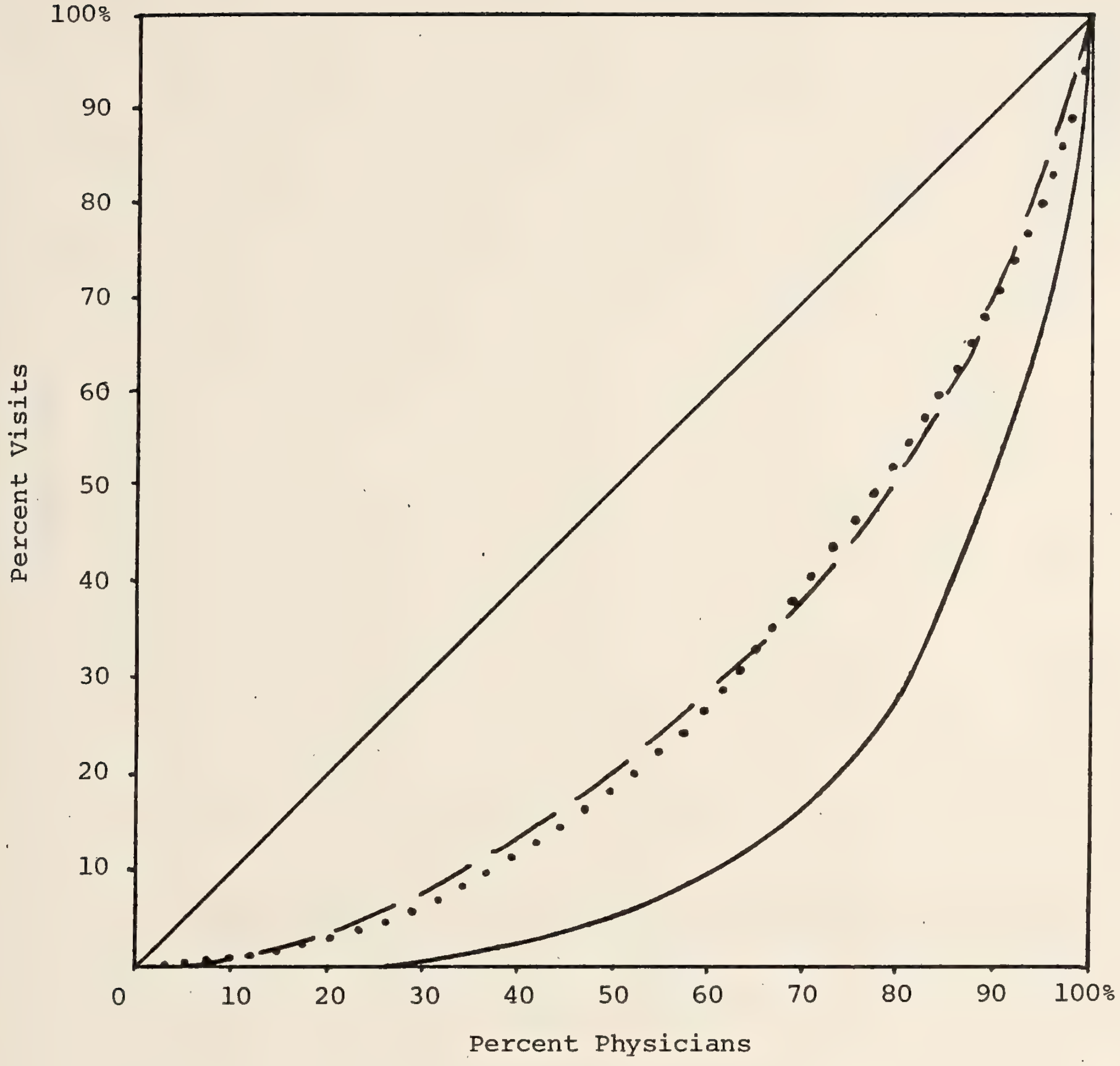

Figure 5-1

LORENZ CURVE: MEDICAL SPECIALISTS

KEY:

———————— Medicaid

— — — Medicare

• • • • • • • • • Blue Shield

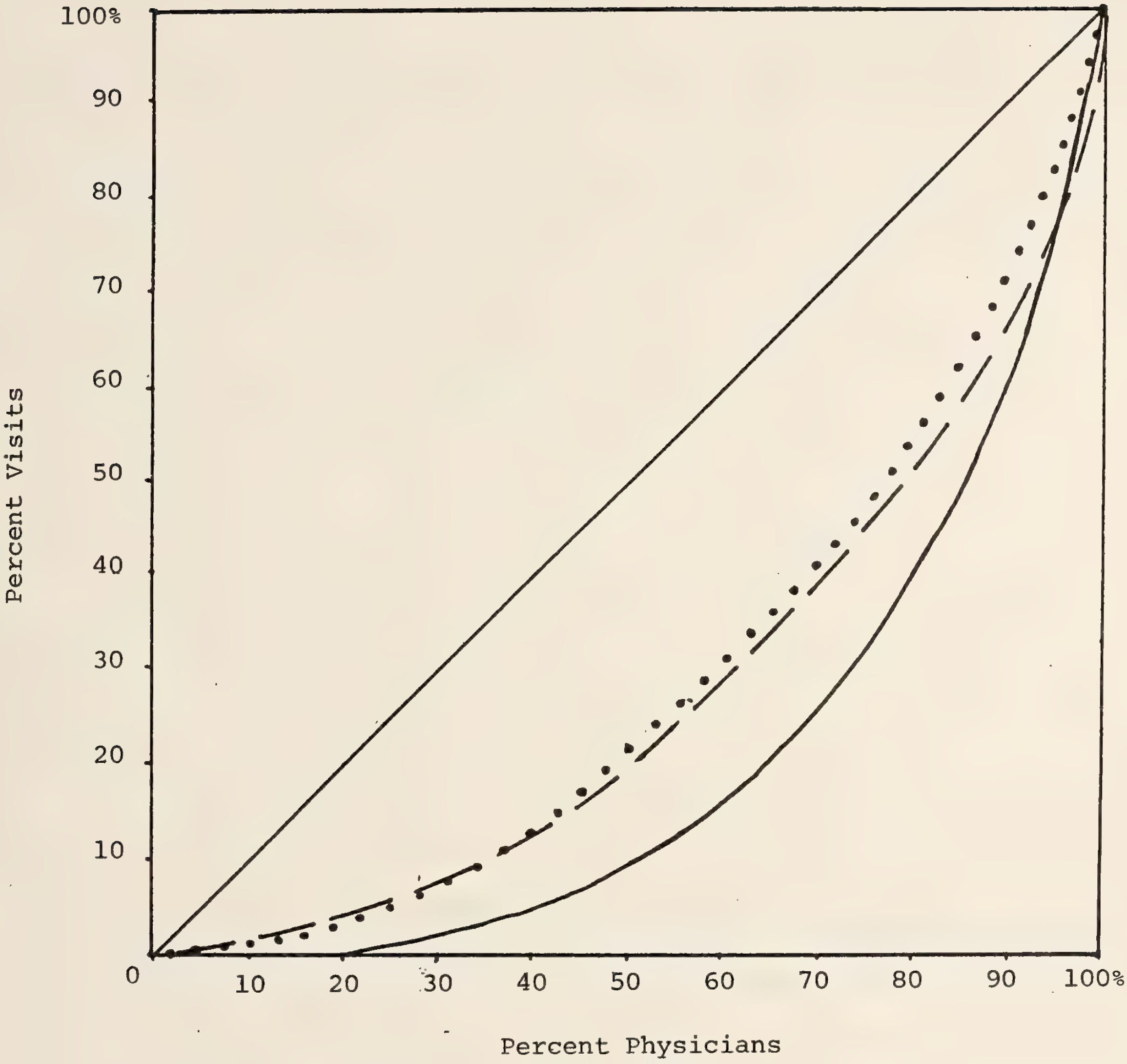

Figure 5-2

LORENZ CURVE: SURGICAL SPECIALISTS

KEY:

——————— Medicaid

— — — Medicare

• • • • • • • • • • • Blue Shield

A summary measure of maldistribution is provided by the Gini Index of Concentration, defined as the ratio of the area between the Lorenz curve and diagonal to the total area below the diagonal. The Gini Index thus ranges between 0 and 1, with zero representing perfect equality, i.e., no area between the Lorenz and diagonal, and one, perfect inequality. Table 5-4 presents Gini indices for Medicaid, Medicare and Blue Shield patients by specialty group. Gini coefficients for Medicaid patients are .69 and .60 for medical and surgical specialists, respectively. summarizing the relatively greater maldistribution for medical specialists seen in the Lorenz curves. The fact that Medicaid patients appear to be less evenly distributed among primary care physicians than among surgical specialists with a Gini coefficient of .65 is rather surprising, given their generally high participation levels. The probable explanation is the low participation rate for one of the five primary care specialties; over one-third of OB-GYNs (36.8%) do not treat any Medicaid patients (Mitchell and Cromwell, 1980). Depending on the relative contribution of OB-GYNs to the Gini Index for all primary care physicians, this hypothesis should more or less explain the differential.

Compared with Medicaid patients, both Blue Shield and Medicare patients are more evenly distributed across physicians, although significant inequalities still remain. There are no real differences between medical and surgical specialists. Primary care physicians, on the other hand, show much greater inequalities in the distribution of Medicare patients than do the medical and surgical specialists. This finding can simply be attributed to casemix differences; while urologists, cardiologists, ophthalmologists and gastroenterologists all devote a substantial portion of their practices to the elderly, OB-GYNs infrequently, and pediatricians never, treat those over age 65.

All in all, these findings indicate that a relatively small number of physicians are, in fact, treating the majority of Medicaid patients. Table 5-5 shows the actual proportion of Medicaid patients seen by large Medicaid practice physicians. The fact that more than half of Medicaid visits to medical specialists, and 40% of the visits to surgical specialists, are being provided by LMP physicians, who constitute only about 13% of all subspecialists, is indeed cause for concern among policy makers as to the access and the quality of care being afforded public beneficiaries.

TABLE 5-4

GINI INDICES OF CONCENTRATION BY THIRD PARTY PAYOR

	Blue Shield Visits	Medicare Visits	Medicaid Visits
Primary Care Physicians[a]	.46	.54	.65
Medical Specialists	.45	.43	.69
Surgical Specialists	.42	.44	.60

[a] Source: Mitchell and Cromwell, 1980.

TABLE 5-5

SIZE DISTRIBUTION OF MEDICAID PATIENTS BY MEDICAID PRACTICE SIZE: SECONDARY SPECIALISTS

Medicaid Practice Size	Percent of Physicians	Percent of Medicaid Patients
Medical Specialties		
None	26.6%	0.0%
Small	60.0	46.7
Large	13.4	53.3
Total	100%	100%
Surgical Specialties		
None	17.1%	0.0%
Small	69.4	59.6
Large	13.4	40.4
Total	100%	100%

5.3 Physician Credentials

Large Medicaid practices have often been characterized in the literature as being managed by physicians with relatively less training. We observed earlier that ELMP primary care physicians generally were less qualified than their SMP colleagues. Is the same true of specialists with large Medicaid practices?

Table 5-6 compares specialists' credentials and training by Medicaid practice size. Surprisingly enough, small and large Medicaid practice specialists appear equally well-trained. With the exception of LMP urologists and ophthalmologists, for instance, there are no significant differences in the proportion of secondary specialists who are board-certified. Within these two specialties, however, notable differences do exist between SMP and LMP physicians. While 76 percent of SMP ophthalmologists are board-certified, only 62 percent of LMP ophthalmologists are equally credentialled. Similarly, only 53 percent of LMP urologists are board-certified, compared with 76 percent of their SMP colleagues.

Unlike primary care LMP physicians, LMP specialists are no more likely on average to have graduated from foreign medical schools than their SMP counterparts. Again, however, ophthalmologists and urologists are an exception to the rule, although only in the case of ophthalmologists are the differences significant (6.6% of LMP ophthalmologists are FMGs vs. 1.8% of SMPs). When we restrict the definition of FMGs even further to include only medical graduates from the Third World, no significant differences between small and large Medicaid practices remain.

With respect to hospital affiliation, LMP specialists generally resemble their SMP colleagues. Worth noting, however, is the fact that nonparticipants as a group are actually less likely to be hospital affiliated than specialists who do participate in Medicaid -- just the opposite of what we might expect. This is particularly true in the fields of allergy, dermatology and ophthalmology, where almost twice as many nonparticipants as participants lacked hospital affiliation.*

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*Because our primary interest lies in comparing small and large Medicaid practice physicians, these differences were not tested for statistical significance.

TABLE 5-6

SECONDARY SPECIALISTS: CREDENTIALS BY MEDICAID PRACTICE SIZE

Specialty	Board Certification (%) None	Board Certification (%) SMP	Board Certification (%) LMP	Foreign Medical Graduate (%) None	Foreign Medical Graduate (%) SMP	Foreign Medical Graduate (%) LMP	Third World Foreign Medical Graduate (%) None	Third World Foreign Medical Graduate (%) SMP	Third World Foreign Medical Graduate (%) LMP
Allergy	43.4	63.2	61.5	11.3	8.8	5.6	3.7	5.3	4.4
Cardiology	58.4	66.9	54.6	9.5	13.5	8.9	7.1	7.9	8.9
Dermatology	80.0	79.6	74.1	8.2	4.5	5.2	0.0	2.7	5.2
Gastroenterology	44.7	66.7	63.9	17.2	9.8	5.3	17.2	6.3	4.4
Neurosurgery	62.4	71.9	57.8	2.6	16.7	8.1	2.6	13.9	8.0
Ophthalmology	75.8	76.4	61.5**	6.4	1.8	6.6*	2.8	1.0	2.2
Orthopedic Surgery	77.6	86.7	76.6	0.4	4.6	7.6	0.4	2.6	7.6
Otolaryngology	72.3	77.0	73.0	13.6	11.6	11.8	9.5	7.5	10.5
Urology	84.6	75.6	52.8***	1.5	5.8	19.1	0.0	4.5	9.6

Specialty	No Hospital Affiliation (%) None	No Hospital Affiliation (%) SMP	No Hospital Affiliation (%) LMP	Older MDs % ≥ 60 yrs None	Older MDs % ≥ 60 yrs SMP	Older MDs % ≥ 60 yrs LMP	Younger MDs % < 40 yrs. None	Younger MDs % < 40 yrs. SMP	Younger MDs % < 40 yrs. LMP
Allergy	13.5	3.0	8.5	36.4	11.3	29.8	14.3	12.5	11.3
Cardiology	0.7	4.5	0.9	42.1	19.8	25.3	19.3	21.1	21.2
Dermatology	35.3	24.1	17.4	24.8	16.2	19.9	33.6	31.4	55.5***
Gastroenterology	3.2	0.0	0.0	33.5	11.7	1.7*	12.5	30.0	52.1**
Neurosurgery	0.0	0.0	0.0	6.4	9.4	6.2	30.7	17.9	28.0
Ophthalmology	8.7	4.4	4.0	27.3	20.3	12.1	13.7	25.5	47.9***
Orthopedic Surgery	3.9	0.2	0.0	27.1	7.5	15.8	10.2	28.5	39.0
Otolaryngology	2.3	3.8	1.0	39.8	24.3	22.9	20.7	34.1	31.9
Urology	1.4	0.9	0.0	51.1	13.3	5.2	12.2	23.4	25.3

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

Finally, we come to the age distribution of specialists by Medicaid practice size. While not considered a physician "credential" as such, age is expected to have some effect on the demand for physician services. Older physicians, defined here as those sixty years and older, may be perceived by patients as less well trained in the newer medical technologies and innovations than physicians more recently out of medical school, and hence less desirable. Conversely, younger specialists, fresh out of school, have had less time and experience to establish a strong private practice. In either case, these physicians may be disproportionately forced into the Medicaid market through lower private demand.

According to Table 5-6, this appears to be the case, at least for some of the younger specialists. LMP dermatologists, gastroenterologists and ophthalmologists were significantly more likely to be younger; close to half of the LMP physicians in these specialties were under forty years of age. On the other hand, LMP specialists were not found to be disproportionately older than their SMP counterparts. Older LMP gastroenterologists, in fact, were significantly underrepresented relative to SMPs (less than 2% of whom were sixty years or older compared to 12% for SMP gastroenterologists). Such findings are consistent with the hypothesis that older physicians may have a greater desire for leisure, or have a restricted work week due to health reasons, thus reducing their propensity to treat Medicaid patients.

In two of the specialties, dermatology and orthopedic surgery, LMPs are concentrated in both tails of the age distribution, and combining younger and older physicians exacerbates the difference between large and small Medicaid practices. While three-quarters of LMP dermatologists are at either end of the age distribution (either younger than forty or older than sixty), only 41 percent of their SMP colleagues fall into these age groups. Similary, 55 percent of LMP orthopedic surgeons are at either extreme, compared to only 36 percent of SMPs.

5.4 Physician Earnings

5.4.1 Size Distribution of Income

It has been suggested in the literature that LMP physicians earn incomes which are unjustified given their background and training. Before comparing annual earnings by size of Medicaid practice, however, it would be interesting to look at specialists' incomes more generally. Tables 5-7 and 5-8 present the size distribution of physician net incomes by specialty, with mean incomes shown at bottom. Accompanying the tables are graphical representations of the two income distributions, shown in Figures 5-3 and 5-4.

Mean net incomes are highest for neurosurgeons ($87,865 per annum) and lowest for psychiatrists ($51,646), as expected. Orthopedic surgery and cardiology are also among the most lucrative specialties; physicians in these two fields average $83,650 and $80,348, respectively. Such incomes seem particularly high in comparison to those of allergists, dermatologists, ophthalmologists and ENTs, whose average net income falls in the mid-sixty thousand dollar range. Finally, mean incomes of urologists and gastroenterologists are about halfway between the high and low ends of the income spectrum, at about $72,000.

Differences in specialists' annual earnings are particularly striking at the two tails of the income distribution. More than one-third of psychiatrists earned less than $40,000, compared to merely 7 percent of neurosurgeons. A sizeable proportion of allergists, ophthalmologists and ENTs (over 15%) had comparably low incomes as well. At the other end of the spectrum, physicians earning $100,000 or more, we find a concentration of neurosurgeons and orthopedic surgeons. Fully one-quarter of neurosurgeons and one-fifth of orthopedic surgeons fall into the high income group, compared to a very small fraction of dermatologists and psychiatrists (6.5% and 5.2%, respectively).

TABLE 5-7

SIZE DISTRIBUTION OF NET INCOMES BY SPECIALTY: MEDICAL SPECIALISTS AND PSYCHIATRISTS

Income Category[a]	Allergists	Cardiologists	Dermatologists	Gastroenterologists	Psychiatrists
$\leq$ $20,000	3.1%	3.0%	1.1%	2.6%	3.8%
$20-30,000	6.2	3.3	4.5	0.9	12.7
$30-40,000	7.3	4.5	6.8	4.8	19.4
$40-50,000	17.7	7.0	12.4	8.4	19.2
$50-60,000	12.5	10.4	16.4	19.2	19.2
$60-70,000	24.0	14.6	22.4	18.7	10.1
$70-80,000	7.2	15.7	14.7	14.2	4.1
$80-90,000	6.2	24.0	8.0	8.3	4.4
$90-100,000	5.2	5.6	7.1	9.2	1.8
$100-110,000	2.1	4.3	3.2	4.1	2.8
$110-120,000	1.0	1.7	1.7	2.0	1.3
$120-130,000	2.1	2.0	0.2	6.7	0.2
$130-140,000	0.0	0.3	0.3	0.4	0.0
$140-150,000	2.1	0.0	0.0	0.0	0.3
$150-200,000	2.1	1.7	0.7	0.4	0.5
$200,000 +	1.0	2.0	0.4	0.0	0.1
$\bar{x}$ (mean)	$64,907	$80,348	$65,618	$71,883	$51,646

[a] All incomes expressed in 1977 dollars, and adjusted for regional cost-of-living differences.

TABLE 5-8

SIZE DISTRIBUTION OF NET INCOMES BY SPECIALTY: SURGICAL SPECIALISTS

Income Category[a]	Neurosurgeons	Ophthalmologists	Orthopedic Surgeons	Otolaryngologists	Urologists
≤ $20,000	0.8%	6.8%	1.1%	7.5%	1.5%
$20-30,000	2.7	3.1	3.3	4.0	2.9
$30-40,000	3.4	7.1	4.1	9.1	5.5
$40-50,000	5.5	13.0	5.2	7.5	7.9
$50-60,000	5.6	14.1	10.0	12.0	10.4
$60-70,000	10.5	18.7	8.0	17.2	21.1
$70-80,000	5.1	12.7	14.0	14.4	18.9
$80-90,000	14.0	6.2	19.0	7.7	12.8
$90-100,000	16.9	2.7	16.0	6.8	6.0
$100-110,000	12.1	8.7	5.2	7.5	5.8
$110-120,000	4.0	1.7	1.6	2.8	1.7
$120-130,000	0.8	0.5	2.4	1.0	1.6
$130-140,000	2.2	1.6	4.7	0.7	1.4
$140-150,000	1.8	1.9	0.6	0.6	0.8
$150-200,000	3.7	0.8	4.2	0.8	1.1
$200,000 +	0.9	0.6	0.8	0.3	0.7
$\bar{x}$ (mean)	$87,865	$66,804	$83,650	$67,330	$73,698

[a] All incomes expressed in 1977 dollars, and adjusted for regional cost-of-living differences.

FIGURE 5-3

SIZE DISTRIBUTION OF PHYSICIAN NET INCOMES BY SPECIALTY:

MEDICAL SPECIALISTS AND PSYCHIATRISTS

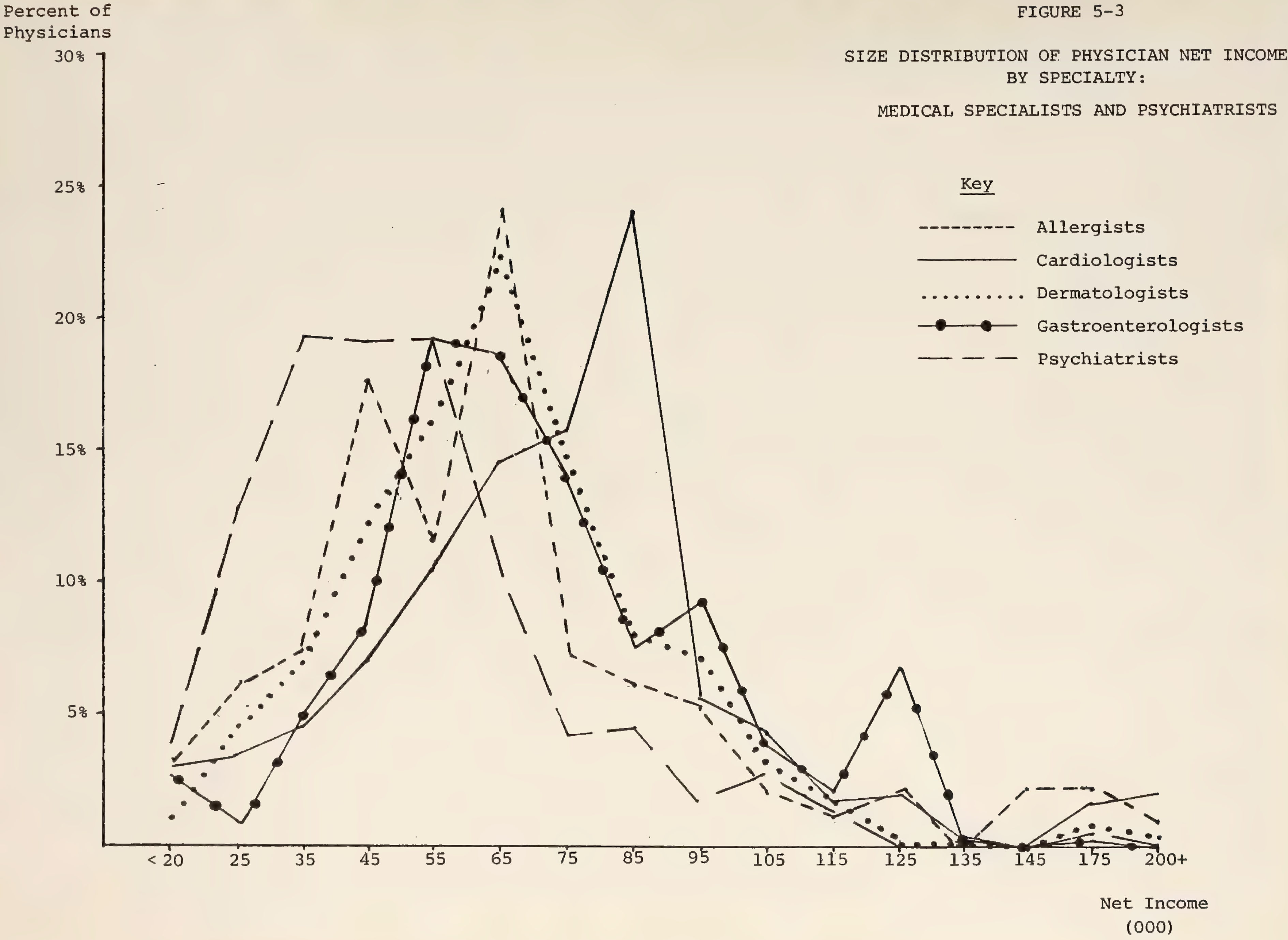
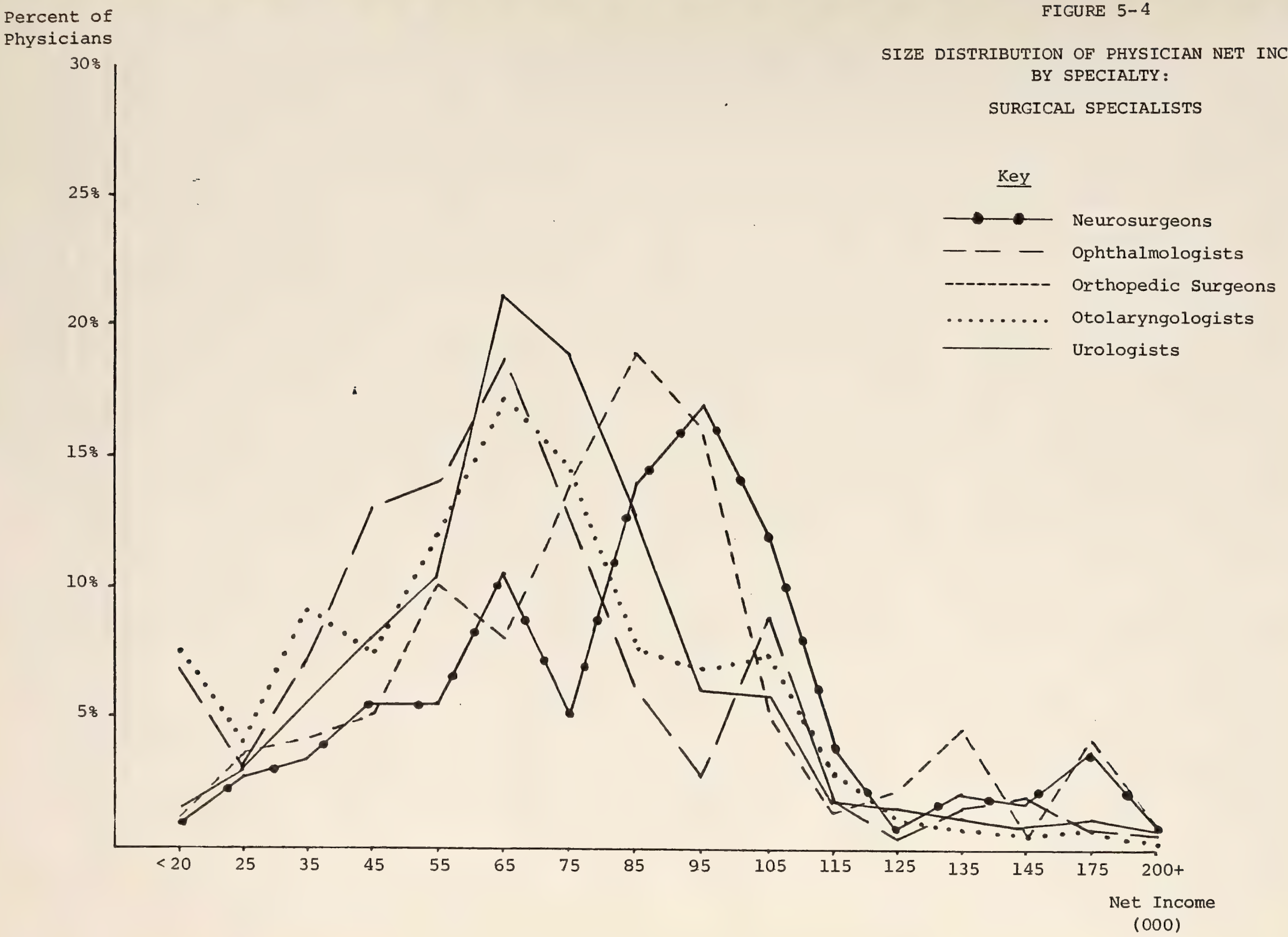


FIGURE 5-4

SIZE DISTRIBUTION OF PHYSICIAN NET INCOMES BY SPECIALTY:

SURGICAL SPECIALISTS



The above findings suggest that a number of the income distributions, particularly for medical specialists and psychiatrists, have a considerable rightward skew. According to Figures 5-3 and 5-4, this appears to be the case. Psychiatrists' incomes are least normally distributed of all secondary specialists, reflecting the fact that nearly three-quarters of psychiatrists in our sample earned below $60,000 annually. With the exception of cardiologists, whose incomes follow a fairly normal distribution, income distributions in the medical specialties were positively skewed as well. Surgical specialists' incomes, by contrast, are quite normally distributed, particularly in neurosurgery and orthopedic surgery.

5.4.2 Physician Incomes by Medicaid Practice Size

A major concern of policymakers has been that large Medicaid practice physicians are earning extraordinary incomes, either through fraud and abuse of public programs or by shortening visit contacts to entertain larger patient caseloads. According to Table 5-9, presenting average net incomes by size of Medicaid practice, secondary specialists with LMPs evidently do not enjoy higher than average incomes. In fact, LMP specialists generally earn slightly less than their SMP colleagues, with the exception of dermatologists and gastroenterologists.* (It is actually paradoxical that any LMP specialists can earn more than their SMP peers given their greater reliance on low Medicaid fees.) The only income differential between large and small Medicaid practice physicians of statistical significance was found for urologists; LMP urologists earned 19% less on average than SMP urologists.

Table 5-10 examines specialists' earnings by adjusting net incomes for hours worked. This effectively captures any underlying variation in physician work effort (although variations in productivity may, of course, remain). The result is an imputed hourly wage which provides a rough measure of the physician's economic return to labor. Adjusting for work effort has little effect on earnings; LMPs continue to earn somewhat less than SMPs in general. Urologists' earnings are no longer significantly lower in LMPs after controlling for hours worked. LMP orthopedic surgeons, however, do earn significantly less than SMPs ($30.98 per hour versus $42.14 for SMP orthopedic surgeons, a 36% difference).

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*Results from our previous LMP work also showed LMP dermatologists to earn more than SMPs, but the difference formerly proved significant. Changing the LMP definition was probably responsible for reducing the disparity in income between the two groups.

TABLE 5-9

PHYSICIAN NET INCOMES[a] BY SIZE OF MEDICAID PRACTICE

	Medicaid Practice Size		
Specialty	None	SMP	LMP
Allergy	$69,052	$66,302	$62,926
Cardiology	68,214	86,918	81,846
Dermatology	60,106	66,717	71,596
Gastroenterology	68,652	71,909	74,723
Neurosurgery	87,389	87,848	88,557
Ophthalmology	62,208	68,982	61,831
Orthopedic Surgery	74,763	86,626	80,270
Otolaryngology	57,309	70,397	64,738
Urology	73,107	75,453	63,496**

[a] Adjusted for cost-of-living (1977 dollars)

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

TABLE 5-10

IMPUTED PHYSICIAN HOURLY WAGES[a] BY SIZE OF MEDICAID PRACTICE

	Medicaid Practice Size		
Specialty	None	SMP	LMP
Allergy	$40.31	$38.68	$33.88
Cardiology	30.21	38.33	33.73
Dermatology	35.65	40.58	42.30
Gastroenterology	38.02	34.34	34.24
Neurosurgery	40.94	41.74	39.83
Ophthalmology	31.39	36.37	32.16
Orthopedic Surgery	39.37	42.14	30.98**
Otolaryngology	28.87	34.62	31.82
Urology	33.62	36.78	31.20

[a] Adjusted for cost-of-living (1977 dollars).

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

5.4.3 Physician Hourly Wage Regression

We know from Table 5-10 that, on average, wage rates of secondary specialists do not differ systematically by size of Medicaid practice. Nor does the background and training of large and small Medicaid practice physicians appear to be different. Yet it is still possible that confounding factors, such as physician demand, are concealing differences in hourly earnings between the two groups.

To explore this issue, imputed hourly wages of all secondary specialists were regressed on a range of physician credentials and other exogenous variables that might affect returns to labor.* Credential variables included whether the physician was board-certified, hospital affiliated, a foreign medical graduate, and the physician's age and sex. Dummy variables for specialty were included as a measure of demand and returns to training; neurosurgeons constituted the omitted category. Other demand variables used as wage predictors were: county per capita income, cost-of-living adjusted (a proxy for demand); the percent of population over sixty-five (a proxy for Medicare coverage and health status); the physician to population ratio at the county level (a measure of physician competition and demand); and dummy variables for large and small cities (rural areas constituted the omitted category). Positive residuals from this regresssion should reflect returns over-and-above those attributable either to the background and training of the physician or to location choice. If, on the other hand, LMP physicians are earning even less than might be expected from their credentials or from economic factors, then residuals should be negative.

Because physicians' earnings are interesting in and of themselves, the wage equation is presented in Table 5-11, with the mean wage residuals for the three Medicaid practice groups at bottom. It is not surprising that all specialists have lower hourly earnings than neurosurgeons given the lengthy training period and stringent certification requirements for neurosurgery. It is rather surprising, however, that once demand factors and physician credentials are held constant, allergists and dermatologists are the only specialists who do not earn significantly less than neurosurgeons on an hourly basis. Perhaps the fact that both of these specialties treat

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*This model was drawn from Sloan (1974).

TABLE 5-11

PHYSICIAN IMPUTED HOURLY WAGE REGRESSION AND RESIDUAL ANALYSIS FOR MEDICAID PARTICIPATION: SECONDARY SPECIALISTS

Variables	Regression Coefficients
ALL	-1.32
CARD	-5.09**
DERM	-1.58
GI	-5.17*
OPHTHAL	-5.62***
ORTHO	-3.29*
ENT	-7.62***
URO	-6.37***
BOARD	3.53***
FMG	-1.30
NOHOSP	0.74
MDAGE	1.40***
MDAGESQ	-0.01***
FEMALE	-0.97
Y	0.63
OVER65	0.01
MDPOP	0.04
LMETRO	-1.75
SMETRO	-1.79
CONSTANT	1.86
	$R^2(c)=0.03$
	F(19,2251)=4.87***

	Medicaid Practice Size		
	None	SMP	LMP
Mean Wage Residual	-1.54*	0.73	-0.91

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

a relatively healthy casemix and hence may see more patients per hour provides an explanation. Alternatively, these physicians may order more ancillary services, thereby supplementing their incomes. In any case, their ability to generate such high hourly wages is quite an unexpected finding.

Of the credential measures included in the equation, only two had a significant impact on physician wages. Both board-certification (BOARD) and physician experience (MDAGE) increased hourly earnings, although the latter did so at a declining rate as the physician grows older (MDAGESQ). Physician sex (FEMALE) had no real effect on returns to labor, nor did the lack of hospital affiliations (NOHOSP). It is rather surprising that being an FMG does not notably affect specialists' wages, in sharp contrast to findings for primary care where foreign training lowers wages significantly. Perhaps because these FMGs are so specialized, they are not perceived by patients as any less qualified than their colleagues.

Per capita income, as a measure of demand, had no significant impact on specialists' wages, although a t-value of 1.50 suggests that this variable does contribute to the explanatory power of the equation. Similarly, the two locational variables (METRO1 and METRO2) explain some of the variation in wages (with t-values of 1.28 and 1.36), but not enough to attain statistical significance. The proportion of elderly persons in the population (ELDERLY) was also insignificant. Finally, the physician-to-population ratio in a county (MDPOP) had no appreciable effect on specialists' wages. There are two possible explanations for this last finding, however. First, competition may just be less important in the secondary specialties. A second, and more likely explanation is that our MDPOP variable does not adequately measure competition for the specialists as it represents the supply of all patient care physicians rather than just those who, strictly speaking, can be considered specialists' substitutes (e.g., a GP is little competition to a neurosurgeon).

LMP wage residuals were negative, although insignificant, implying that hourly earnings of LMP specialists were slightly lower than their credentials and other economic factors would suggest. Wage residuals for SMPs, on the other hand, were positive (but also insignificant), reflecting higher than predicted returns to labor. To determine whether the two groups differed from each other, however, required a t-test of the two mean wage residuals. Hourly earnings of LMPs and SMPs are notably different, although the results of the test do not quite achieve statistical significance at conventional levels (t=1.61). It thus appears that specialists with large Medicaid caseloads are financially penalized for entering the public market.

5.5 Caseload and Work Effort

Physician caseloads have been a major concern regarding large Medicaid practices for two reasons. *First*, high volume in these practices may suggest that many Medicaid visits may be of marginal benefit or even unnecessary. Any such inducement by physicians will clearly drive up Medicaid expenditures. *Second*, high volume in LMPs may be achieved through shorter physician contacts, thus lowering quality of care for Medicaid recipients.

Table 5-12 presents specialists' average caseloads and work effort by size of Medicaid practice. In most specialties, we find that LMP physicians do not have unusually large caseloads; in fact, they often see fewer patients *in toto* than SMPs.* This is particularly true of LMP dermatologists, who treat about 20 percent fewer patients per week than SMPs (150/184). There are several notable exceptions to this general finding, however. LMP allergists, cardiologists and neurosurgeons are providing significantly more visits per week than their colleagues with smaller Medicaid practices. The difference is most evident in cardiology, where LMPs provide 60 percent more visits than SMPs, and 87 percent more than nonparticipants. In fact, LMP cardiologists have the greatest total visit volume of all specialists, averaging 213 visits per week.

The primary sources of variation in total visit volume between small and large Medicaid practice physicians are office and inpatient visits. Greater numbers of LMP emergency room and clinic visits are also reflected in the higher total visit measures, but to a much lesser extent due to their small absolute size.

If LMP physicians with unusually heavy caseloads were working considerably harder than SMPs, these large disparities might be justified, at least in terms of physician/patient contacts. But this does not appear to be

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*Total visits (hours) represent the unweighted sum of six visit (hours) categories, including: office, inpatient, emergency room, house calls, and nursing home visits, plus the number of operations. Figures for house calls and nursing home visits are not presented as separate categories as they were an extremely small proportion of all subspecialists' caseloads. Hence, summing individual visit categories will yield a number slightly less than the total visits shown.

TABLE 5-12

CASELOAD AND WORK EFFORT BY MEDICAID PRACTICE SIZE

	Medicaid Practice Size		
Work Effort (per week)	None	SMP	LMP
Allergy			
Total Visits	136.4	156.2	194.8*
Total Patient Care Hours	38.6	40.7	42.1
Length of Office Visit(minutes)	21.6	25.0	16.1***
Office Visits	119.2	140.9	169.5
Inpatient Visits	8.4	8.1	18.5***
Emergency Room/Clinic Visits	5.9	4.2	7.0
Operations	0.2	0.0	0.1
Cardiology			
Total Visits	114.2	132.9	213.2***
Total Patient Care Hours	48.2	52.4	55.2
Length of Office Visit(minutes)	30.0	27.5	23.4
Office Visits	62.3	61.1	84.5**
Inpatient Visits	43.5	61.2	107.9***
Emergency Room/Clinic Visits	4.3	6.5	14.6**
Operations	1.2	1.8	1.0
Dermatology			
Total Visits	154.6	183.5	149.9**
Total Patient Care Hours	38.4	38.7	37.2
Length of Office Visit(minutes)	17.2	14.6	17.0*
Office Visits	141.0	173.4	136.5**
Inpatient Visits	5.0	4.1	6.8
Emergency Room/Clinic Visits	4.2	1.6	3.4*
Operations	2.0	2.8	0.4
Gastroenterology			
Total Visits	124.9	122.5	136.6
Total Patient Care Hours	45.8	48.3	49.5
Length of Office Visit(minutes)	26.0	26.7	27.3
Office Visits	71.9	60.3	60.1
Inpatient Visits	43.9	46.0	63.1**
Emergency Room/Clinic Visits	2.3	6.8	5.7
Operations	1.9	4.4	5.2
Neurosurgery			
Total Visits	120.5	122.9	151.1**
Total Patient Care HOurs	48.8	50.1	51.2
Length of Office Visit(minutes)	28.4	30.7	28.6
Office Visits	39.4	37.9	55.3**
Inpatient Visits	65.7	71.7	77.5
Emergency Room/Clinic Visits	3.9	6.1	12.7**
Operations	4.1	4.5	3.7*

TABLE 5-12 cont.

CASELOAD AND WORK EFFORT BY MEDICAID PRACTICE SIZE

Work Effort (per week)	Medicaid Practice Size None	SMP	LMP
Ophthalmology			
Total Visits	133.9	134.2	126.7
Total Patient Care Hours	43.9	43.7	44.4
Length of Office Visit (minutes)	25.2	24.3	23.9
Office Visits	114.5	115.8	109.7
Inpatient Visits	12.6	12.5	10.8
Emergency Room/Clinic Visits	2.6	2.2	2.4
Operations	3.0	2.9	3.5
Orthopedic Surgery			
Total Visits	128.8	163.9	158.2
Total Patient Care Hours	45.5	52.7	57.6*
Length of Office Visit (minutes)	23.6	18.2	17.8
Office Visits	74.2	92.7	84.3
Inpatient Visits	39.1	51.7	48.0
Emergency Room/Clinic Visits	7.1	11.1	15.0*
Operations	4.0	6.3	5.9
Otolaryngology			
Total Visits	137.8	151.2	134.0
Total Patient Care Hours	44.4	46.6	45.9
Length of Office Visit (minutes)	18.4	16.6	18.0
Office Visits	113.3	108.8	99.2
Inpatient Visits	15.3	26.9	18.3*
Emergency Room/Clinic Visits	2.9	6.1	6.4
Operations	5.0	8.1	6.2
Urology			
Total Visits	147.6	149.4	131.5
Total Patient Care Hours	53.9	48.8	49.9
Length of Office Visit (minutes)	21.8	19.1	24.4***
Office Visits	58.6	75.9	67.0
Inpatient Visits	70.1	57.8	51.2
Emergency Room/Clinic Visits	4.0	3.2	3.2
Operations	7.6	9.5	7.2**

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

the case, according to Table 5-12. While LMPs in several of the specialties worked somewhat longer hours than their colleagues, most of the differences were slight. Only LMP orthopedic surgeons worked significantly harder than SMPs, and then by only five hours per week on average (or about 10% more).

To explore this question of patient contact more thoroughly, average lengths of office visits were calculated by specialty and Medicaid practice size (also shown in Table 5-12).* In those specialties where LMP physicians were found to have especially large caseloads (allergy, cardiology and neurosurgery), visit lengths were slightly shorter in LMPs. Only for allergists, however, was the difference significant (16 minutes on average for LMPs vs. 25 minutes for SMPs). With regard to visit duration within the other specialties, there was no systematic variation by size of Medicaid practice, with one exception: LMP urologists actually had significantly longer office visits than their SMP colleagues.

Several of the anomalous findings with respect to income may well be explained by differences in visit volume. LMP neurosurgeons' ability to match the incomes of their SMP peers while relying more heavily on low Medicaid fees can be attributed to heavier patient caseloads, for example. Similarly, unusually low incomes of LMP urologists are partially due to the provision of fewer total visits (including significantly fewer operations). Yet not all disparities in income between large and small Medicaid practice physicians are attributable to a volume effect. Incomes of LMP dermatologists, for instance, become even more puzzling when visit volume is taken into consideration -- how are they able to earn higher incomes than SMPs ($71,596 vs. $66,717) when providing significantly fewer visits? One explanation is higher rates of ancillary utilization, and we explore this directly in the following section.

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*The average length of an office visit was determined by constructing a ratio of total office hours to total office visits. One problem with calculating visit lengths in this manner is that all hours spent by a physician in his office are not necessarily with patients, i.e., "down time," is not taken into account. Because there was no way to estimate "down time," visit lengths are undoubtedly subject to some small upward bias. As there is no reason to believe that down time varies systematically with Medicaid practice size, comparisons between the groups should be relatively unaffected.

5.6 Ancillary Services

One aspect of the Medicaid program particularly open to physician abuse is ancillary service utilization. As ancillary services are not included in the physician's usual fee, but instead are reimbursed separately by Medicaid, physicians may have an incentive to overprescribe them in order to maximize gross practice revenues. Unnecessary use of ancillaries, therefore, could be considered an identifying characteristic of a Medicaid mill. Although it is impossible to determine the medical necessity of ancillary utilization in LMPs, we can compare utilization by size of Medicaid practice using SMPs as a benchmark for appropriateness.

Tremendous variation in ancillary utilization does exist across specialties, of course, but this is largely a function of differences in casemix and practice style. Gastroenterologists, for instance, are much more likely to rely heavily on laboratory tests and x-rays for diagnostic purposes than are ophthalmologists, a large portion of whose practice is devoted to correcting refractive and other condiitons of the eye (NCHS, 1978d). Dermatologists provide yet another example of variation in ancillary utilization across specialties, performing office surgery at more than three times the rate of all other secondary specialists. Hence, it is particularly important to make within-specialty comparisons of ancillary use to provide some control for casemix variation.

The NORC survey asked each physician to estimate the percent of patients for which he ordered four basic types of ancillary services: laboratory tests, injections or immunizations, x-rays, and office surgery. Table 5-13 presents the average frequency with which each of these services is ordered by specialty and Medicaid practice size. In general, LMP specialists do not appear to order ancillaries with any greater frequency than do their colleagues. There are several notable exceptions to this generalization, however. LMP neurosurgeons do order significantly more laboratory tests than SMPs, recommending testing for 31 percent of their patients compared to 18 percent in SMPs. They order five times as many injections as well (12.1% vs. 2.4%). Urologists and cardiologists with large Medicaid caseloads also give significantly more injections than their SMP counterparts. The only noteworthy difference between small and large Medicaid practice specialists in the frequency with which x-rays are ordered is found for ENTs. (LMP otolaryngologists still only order x-rays for 17% of their patients, not

TABLE 5-13

ANCILLARY SERVICES BY MEDICAID PRACTICE SIZE

Specialties	LABWORK (%)			SHOTS (%)			XRAYS (%)			OFFICE SURGERY (%)		
	None	SMP	LMP	None	SMP	LMP	None	SMP	LMP	None	SMP	LMP
Allergy	30.9	33.9	21.2**	80.7	73.1	72.1	5.6	5.0	8.0	0.5	0.3	0.5
Cardiology	52.2	47.3	38.7	14.6	11.2	23.1***	36.5	24.4	22.3	0.2	0.7	0.2
Dermatology	14.9	14.5	15.1	15.7	17.7	17.6	1.5	2.9	5.6	30.9	26.8	37.9***
Gastroenterology	47.0	49.7	58.3	14.0	6.9	10.2	24.5	35.0	29.5	1.8	4.8	5.2
Neurosurgery	13.9	18.1	30.7***	8.1	2.4	12.1***	21.5	29.1	36.3	5.1	0.8	0.8
Ophthalmology	9.6	7.2	4.8	2.6	2.1	1.3	3.3	1.3	1.9	2.4	3.1	3.7**
Orthopedic Surgery	14.7	9.7	11.3	9.6	12.1	13.6	47.5	54.2	58.9	4.3	4.2	4.1
Otolaryngology	15.6	19.5	24.3	18.9	9.7	13.1	9.1	12.0	17.2*	6.1	4.9	5.9
Urology	43.1	69.3	62.2	2.7	4.4	11.1***	8.7	18.3	12.9	9.3	12.6	8.2

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

highly suggestive of a Medicaid mill when compared to an average of 12% for SMPs.) Finally, LMP ophthalmologists and dermatologists perform office surgery with notably greater frequency than SMPs. LMP dermatologists performed a surgical procedure on 38 percent of their patients, compared to 27 percent in SMPs. This may explain how they manage to earn higher incomes without providing more visits.

In sum, there is no consistent pattern of ancillary utilization by specialists with large Medicaid practices. With several important exceptions, LMPs do not order ancillaries more frequently than their SMP colleagues, and in some specialties, utilized them even less.

5.7 Practice Inputs

Auxiliary personnel constitute the primary complementary input to the physician's own time. Yet the use of auxiliary staff in LMPs is of concern for two reasons. First, to the extent that a physician can make effective use of personnel, either in an administrative or assisting capacity, physician productivity (and hence net practice revenues) can be increased. There lies a danger, however, that some physicians may over-delegate medical responsibilities to less well-trained staff, e.g., physician assistants or nursing personnel, thereby jeopardizing the quality of care. The ability to substitute medical staff for physician time will vary considerably by specialty of course, depending on relative casemix complexity. Neurosurgeons, for instance, should be less able to use non-physician substitutes than allergists, who can delegate a wider range of medical responsibilities, such as diagnostic testing and drug therapy.

A second concern with respect to auxiliary personnel in LMPs is that these physicians are skimping on personnel in order to keep practice costs down and net revenues high. This is not only inefficient in that physicians may spend too much time on administrative tasks, but may also result in poor quality care if they are shortchanging patients to free up administrative time.

Table 5-14 presents average full-time equivalents (FTEs) in five personnel categories (clerks, RNs, LPNs, physician assistants and technicians) by specialty and Medicaid practice size, on a per physician basis. Not

TABLE 5-14

AUXILIARY STAFF[a] BY SIZE OF MEDICAID PRACTICE: SECONDARY SPECIALISTS

	None	SMP	LMP
Allergy			
Clerks	1.30	1.39	1.36
RNs	0.47	1.03	0.51***
LPNs	0.41	0.22	0.12
Physician Assistants	0.16	0.09	0.06
Technicians	0.48	0.40	0.22
All	2.83	3.12	2.27***
Cardiology			
Clerks	1.33	1.25	1.62
RNs	0.29	0.25	0.15
LPNs	0.06	0.11	0.05
Physician Assistants	0.04	0.08	0.05
Technicians	0.46	0.35	0.23
All	2.19	2.04	2.10
Dermatology			
Clerks	1.53	1.73	1.16**
RNs	0.12	0.23	0.20
LPNs	0.08	0.29	0.23
Physician Assistants	0.03	0.07	0.07
Technicians	0.31	0.14	0.05
All	2.07	2.46	1.72*
Gastroenterology			
Clerks	0.93	1.03	1.26
RNs	0.12	0.13	0.14
LPNs	0.06	0.09	0.07
Physician Assistants	0.02	0.02	0.04
Technicians	0.33	0.31	0.32
All	1.46	1.58	1.83
Neurosurgery			
Clerks	1.22	1.35	1.43
RNs	0.10	0.16	0.11
LPNs	0.01	0.01	0.02
Physician Assistants	0.00	0.03	0.02
Technicians	0.04	0.05	0.02
All	1.37	1.61	1.60

surprisingly, there is considerable variation in the use of labor inputs by specialty. Allergists as a group tend to use the most aides (2.9 per physician, on average), while urologists, gastroenterologists and neurosurgeons had the fewest. Hence it appears that specialists who spend a relatively greater proportion of their time practicing in hospital and clinic settings tend to employ fewer office aides overall.

The relative mix of auxiliary staff varies by specialty as well. Clerks constitute the largest single category of personnel in all specialties. Neurosurgeons and orthopedic surgeons had the least medical personnel; RNs, LPNs and physician assistants combined accounted for only 11 percent of their auxiliary help. By contrast, almost 40 percent and 28 percent of allergists' and urologists' staffs, respectively, were in these medical occupations. All of these findings are quite consistent with our hypotheses concerning variations across specialties in the substitutability of physician time.

There were no systematic differences between small and large Medicaid practice specialists in overall use of auxiliary personnel. In several specialties (allergy, dermatology and orthopedic surgery), LMPs employed significantly fewer aides than SMPs. It appears that these differences are largely attributable to the employment of fewer nurses, both RNs and LPNs. In the case of dermatologists, however, fewer clerks are the sole source of the differential between SMPs and LMPs.

With the exception of ophthalmologists and gastroenterologists, LMPs employ fewer medical personnel on average than SMPs. Differences are most striking in the fields of allergy, orthopedic surgery, otolaryngology and urology, where SMPs have close to twice as many medical staff as LMPs. LMPs generally employ as many or more clerical aides, however, suggesting that the personnel mix of large and small Medicaid practice physicians is somewhat different. In practically all the specialties (except dermatology and otolaryngology), LMPs do place a heavier emphasis on clerical help. Sixty percent of the aides in allergists' LMPs, for example, are clerks versus only 44 percent in SMPs. Similarly, 77 percent of the auxiliary staff employed by LMP cardiologists is clerical, compared to 61 percent in SMPs.

LMP specialists thus do not appear to substitute medical personnel for their own time. On the contrary, they seem to delegate less of their medical tasks to aides than do their SMP peers. Clerical personnel, on the other hand, are more prevalent in LMPs, probably needed to handle the additional administrative work associated with Medicaid reimbursement.

Now that we have investigated the use of aides in large Medicaid practices, a logical follow-up question concerns physician productivity in these practices. Is productivity significantly enhanced by the use of auxiliary personnel? And do large and small Medicaid practice physicians differ in their average productivity levels, particularly in their ability to utilize aides effectively? To answer these questions we turn to Table 5-15, presenting the impact of auxiliary staff on physician productivity in SMPs and LMPs.

For all Medicaid program participants, we find that productivity (defined as the total number of visits per physician hour of patient care) generally increases with the number of aides employed. Physician productivity seems to fall slightly as we go from less than one FTE to between one and two, but tends to rise gradually thereafter. LMP cardiologists with less than one FTE, for instance, average 3.8 visits per patient care hour, compared to only 3.1 visits per hour in practices with 1-2 FTEs. Adding another aide (i.e., 2.0-2.9) increases visits per hour to 4.5 for these cardiologists, while a third FTE (or more) raises productivity even higher, to 4.8 visits hourly.

To a large degree, productivity (as measured here) depends on casemix, which in turn varies with specialty. As suggested earlier, casemix has important implications for the physician's ability to substitute medical personnel for his own time, thereby increasing the number of patients which can be seen in the practice. Allergists and dermatologists, for example, appear to be the most productive of all the specialists, but this may largely reflect a non-serious casemix which allows for considerable delegation of medical responsibilities. Hence, the less physician time required per patient, the greater can practice volume, or productivity, be. Neurosurgeons, who treat an extremely complex casemix by contrast, have little opportunity to substitute for their own labor. Their productivity thus seems low relative to other specialists, although this is almost certainly a function of an inability to delegate medical tasks. Correspondingly,

TABLE 5-15

IMPACT OF AUXILIARY STAFF ON PHYSICIAN PRODUCTIVITY[a] IN SMPs AND LMPs: SECONDARY SPECIALISTS

	Number of Aides Per Physician									
	0.0-0.9		1.0-1.9		2.0-2.9		3.0+		Total	
Specialty	SMP	LMP	SMP	LMP	SMP	LMP	SMP	LMP	SMP	LMP
Allergy	4.4	4.9	4.2	4.8	4.8	3.7	3.4	6.4	3.9	4.8
Cardiology	2.6	3.8	2.6	3.1	2.5	4.5	2.0	4.8	2.5	3.7
Dermatology	4.6	4.1	4.4	3.3	4.5	5.9	5.7	5.1	4.8	3.9
Gastroenterology	2.5	2.8	2.7	2.6	2.3	2.8	2.2	2.8	2.5	2.7
Neurosurgery	2.1	3.4	2.4	2.5	2.8	3.4	2.7	2.6	2.5	2.9
Ophthalmology	3.0	2.3	2.7	2.9	3.4	3.2	3.7	3.3	3.1	3.0
Orthopedic Surgery	2.9	3.7	2.5	2.9	3.4	2.3	3.3	2.5	3.1	2.8
Otolaryngology	2.9	1.5	2.9	2.4	3.4	2.7	3.3	3.4	3.2	2.6
Urology	3.7	1.7	2.9	2.8	2.9	2.5	3.0	2.4	3.1	2.5
ALL	3.1	2.9	2.9	2.9	3.3	3.1	3.4	3.1	3.1	3.0

[a] Physician productivity is measured in visits per patient care hour.

they employ relatively few medical personnel. Comparisons of physician productivity across large and small Medicaid practices, therefore, should be made within specialty to control for differences in casemix.

In general, productivity differences between SMPs and LMPs show no consistent pattern, varying widely by specialty. Medical specialists with LMPs, particularly cardiologists and allergists, do seem notably more productive than their SMP colleagues, regardless of the number of aides in the practice. The same is true of LMP neurosurgeons. These three groups, who employ a relatively greater proportion of clerical personnel, clearly utilize the time freed up from administrative tasks to see more patients, as evidenced by the unusually large caseloads noted earlier in Table 5-12. LMP dermatologists, by contrast, tend to be less productive than SMPs, possibly reflecting poor delegation of administrative responsibilities, as suggested by fewer clerks.

5.8 Gross Revenues, Costs and Markups

Aside from running high volume practices, skimping on practice inputs, or unnecessary use of ancillary services, there remains another way in which large Medicaid practice physicians can abuse the program: excessive markups over costs. While all private practice physicians have high markups, what is of primary interest here is whether LMPs have high markups relative to their peers. Given low Medicaid fee schedules and the substantial proportion of LMPs' revenues generated by Medicaid reimbursements, our *a priori* expectation is that LMP gross and net revenues (markups) will be lower, *ceteris paribus*.

Markups, defined as the difference between gross revenues per visit and average costs,* are shown in Table 5-16 by specialty and extent of Medicaid participation. Markups are strikingly high for all neurosurgeons as a group (not shown in table), averaging $22.74 per visit, compared with average markups of between $14 and $16 for the other specialties. Dermatologists on the other hand, had particularly low markups overall ($11.97 per visit).

True to expectations, markups were lower overall in LMPs, averaging about 90% of those in smaller Medicaid practices, although this varied considerably by specialty. Both lower gross revenues and higher costs contributed to this variation; average revenues per visit for LMP specialists as a group are 96% ($24.01/$24.87) of those for their SMP colleagues, while costs per visits were about 7% ($9.73/$9.11) higher for LMPs.

Specialty-specific measures show much the same pattern -- gross revenues and markups generally fall as Medicaid participation increases. Neurosurgeons and orthopedic surgeons with LMPs in particular demonstrate this pattern, having significantly lower gross revenues and markups than their SMP peers. While LMP dermatologists had considerably lower markups as well, the source of the difference is higher average costs. It is

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*Physicians provide a variety of services, each with a different markup. A lack of data on individual fees and volume precludes the determination of markups on individual services. As a result, gross billings and total visits were used to approximate average revenues per visit. As the same problem characterized cost data, average cost per visit was imputed in a similar manner using aggregate data.

TABLE 5-16

VISIT COSTS, REVENUES AND MARKUPS BY MEDICAID PRACTICE SIZE: MEDICAL AND SURGICAL SPECIALISTS

Specialty	Gross Revenues Per Visit	Cost Per Visit	Net Revenue Per Visit (Markup)
Allergy			
None	$28.65	$11.05	$17.60
SMP	28.48	14.81	13.67
LMP	18.13**	7.93**	10.20
Cardiology			
None	24.27	9.84	14.43
SMP	24.23	8.67	15.56
LMP	22.21	10.78	11.43*
Dermatology			
None	19.09	5.79	13.30
SMP	18.91	6.70	12.21
LMP	17.20	8.76**	8.44**
Gastroenterology			
None	26.12	8.84	17.29
SMP	23.79	8.02	15.77
LMP	20.81	7.87	12.94
Neurosurgery			
None	32.53	11.50	21.03
SMP	35.51	11.38	24.12
LMP	27.67***	10.92	16.75***
Ophthalmology			
None	25.03	8.83	16.20
SMP	23.26	8.28	14.98
LMP	25.81*	9.73**	16.07
Orthopedic Surgery			
None	31.95	13.32	18.63
SMP	26.48	10.38	16.09
LMP	20.53***	9.95	10.58***

TABLE 5-16 cont.

VISIT COSTS, REVENUES AND MARKUPS BY MEDICAID PRACTICE SIZE: MEDICAL AND SURGICAL SPECIALISTS

Specialty	Gross Revenues Per Visit	Cost Per Visit	Net Revenue Per Visit (Markup)
Otolaryngology			
None	20.97	8.25	12.72
SMP	23.97	9.16	14.81
LMP	28.73***	12.10***	16.64
Urology			
None	22.81	8.42	14.39
SMP	24.51	8.16	16.35
LMP	26.01*	7.43	18.58
ALL			
None	25.44	9.49	15.85
SMP	24.87	9.11	15.76
LMP	24.01	9.75	14.28

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

rather puzzling that practice costs are higher for LMP dermatologists since they have significantly fewer labor inputs. These higher costs may be associated with higher rates of office surgery, however.

Within three specialties, ophthalmology, otolaryngology and urology, markups were actually higher in LMPs, but not significantly so. Higher gross revenues were again the driving force behind the difference in markups, tempered somewhat by higher costs in two of the specialties (ophthalmology and otolaryngology). Higher gross revenues for LMPs in these specialties may be explained by greater ancillary utilization. LMP ENTs, in particular, ordered more of all types of ancillaries than did their SMP peers, while LMP ophthalmologists performed significantly more office surgery. Finally, urologists with LMPs gave more than two and a half times as many injections as SMPs. While ancillary use cannot explain the entire difference in gross revenues, it may provide a partial explanation.

All of these findings raise some interesting questions concerning variations in gross revenues by size of Medicaid practice. As suggested earlier, it is quite paradoxical that any LMPs can generate higher gross revenues per visit given low Medicaid fees, which constitute a relatively greater proportion of their gross practice billings. Of course, if visit mix were different, or usual and Medicaid fees substantially higher, this might explain our anomalous findings for ophthalmologists, ENTs and urologists. Yet visit mix does not appear to differ significantly between SMPs and LMPs in any of these specialties. How about physician fees?

Table 5-17 presents usual and Medicaid fees for a follow-up office visit by specialty and size of Medicaid practice.* Ratios of Medicaid to usual office fees are also provided to facilitate comparisons.** For ENTs and ophthalmologists with LMPs, usual fees are slightly higher than in SMPs ($16.67 vs. $16.09 for ophthalmologists; $16.59 vs. $15.87 for ENTs), although not high enough to explain the difference in gross revenues.

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*Average usual fees undoubtedly overstate payments by some unknown amount due to bad debts, reduced fees, and insuror discounts.

**Data on hospital fees and specialty-specific charges were also collected in the NORC physician survey. Hospital fees are not presented because the ratios between usual and Medicaid fees were nearly identical to those shown. Specialty-specific fees, on the other hand, contained too many missing values for presentation.

TABLE 5-17

USUAL AND MEDICAID FEES FOR FOLLOW-UP OFFICE VISIT BY SPECIALTY, SMPs AND LMPs

	Fees		Ratio of Medicaid to Usual Fee	
Office Visit	SMP	LMP	SMP	LMP
Allergy				
Usual	$16.00	$13.89	0.54	0.68
Medicaid	8.62	9.49		
Cardiology				
Usual	19.91	17.18	0.63	0.71
Medicaid	12.49	12.16		
Dermatology				
Usual	15.30	17.11	0.63	0.72
Medicaid	9.65	12.39		
Gastroenterology				
Usual	18.12	18.10	0.58	0.51
Medicaid	10.47	9.22		
Neurosurgery				
Usual	19.77	18.99	0.55	0.59
Medicaid	10.86	11.20		
Ophthalmology				
Usual	16.09	16.67	0.61	0.65
Medicaid	9.74	10.76		
Orthopedic Surgery				
Usual	15.81	15.69	0.54	0.54
Medicaid	8.58	8.41		
Otolaryngology				
Usual	15.87	16.59	0.61	0.66
Medicaid	9.69	11.03		
Urology				
Usual	15.51	15.20	0.61	0.51
Medicaid	9.46	7.80		

Nor do Medicaid fees provide an answer, averaging only about two-thirds of the physician's stated charge. How some LMP specialists are able to generate these revenues, therefore, remains something of a mystery.

Usual and Medicaid fees are also of interest in their own right. Medicaid fees are considerably below usual fees for all specialists, ranging from about one-half to 72 percent of the physician's stated charge. These findings are consistent with the lower gross revenues (and incomes) observed in the majority of large Medicaid practices, as a greater reliance on low Medicaid payments is expected to reduce gross revenues, *ceteris paribus*. Ratios of Medicaid to usual fees tend to be higher in LMPs, which undoubtedly explains, at least in part, their greater willingness to participate in the Medicaid program.

5.9 Practice Location, Size and Organization

5.9.1 Practice Location

Contrary to popular opinion, large Medicaid practices are not exclusively an urban phenomenon. According to Table 5-18, presenting the size distribution of Medicaid practices by specialty across large (greater than 1.4 million population), small, and non-metropolitan areas, LMP specialists are not generally distributed any differently from SMPs. There are exceptions to this rule, of course; dermatologists, orthopedic surgeons, and otolaryngologists with large Medicaid caseloads are disproportionately located in the largest cities relative to their small Medicaid practice colleagues, while almost three quarters of LMP urologists are found in small cities.

A surprisingly large proportion of LMP specialists are located in rural areas, although this varies somewhat by specialty. Large Medicaid practice allergists, cardiologists, neurosurgeons and to a lesser degree, ophthalmologists, are all more commonly found in nonmetropolitan settings than are their SMP colleagues. Is it possible that these physicians are meeting an unmet demand arising from physician shortages in rural areas? In any case, rural LMPs do not fit the stereotype of the inner city, assembly line Medicaid mills set forth in the Moss investigations.

TABLE 5-18

GEOGRAPHIC LOCATION BY SIZE OF MEDICAID PRACTICE: SECONDARY SPECIALISTS

	None			SMP			LMP		
Specialty	Large Metro[1]	Small Metro[2]	Non-Metro	Large Metro	Small Metro	Non-Metro	Large Metro	Small Metro	Non-Metro
Allergy	55.9	37.9	6.2	53.0	43.3	3.8	30.5	55.7	13.8
Cardiology	78.4	20.0	1.5	41.9	49.4	8.6	44.8	42.0	13.1
Dermatology	49.5	43.7	6.8	44.7	44.8	10.5	55.8	38.7	5.4
Gastroenterology	77.7	9.6	12.7	46.6	38.3	15.1	47.9	45.3	6.8
Neurosurgery	43.3	53.2	3.5	37.1	55.2	7.6	38.2	45.1	16.7
Ophthalmology	52.9	27.8	19.4	41.6	45.1	13.3	44.8	36.2	18.9
Orthopedic Surgery	63.3	32.1	4.6	31.1	52.3	16.5	55.5	28.6	16.0
Otolaryngology	57.3	34.9	7.8	34.2	51.3	14.5	62.0	31.3	5.9
Urology	53.9	30.7	15.4	39.7	44.1	16.2	18.7	73.2	8.1

[1] Greater than 1.4 million population

[2] Between 50,000 - 1.4 million population

One final point of interest concerns nonparticipants. Oddly enough, nonparticipating specialists are more commonly found in large metropolitan areas than LMP physicians, with the exception of dermatologists and ENTs. More than three-quarters of all nonparticipating cardiologists and gastroenterologists practice in the nation's largest cities, for example, compared with less than half of those in LMPs. To some degree, the predominance of secondary specialists in urban areas is to be expected, given the better facilities, newer technology, presence of colleagues, and teaching opportunities associated with large cities. Yet this does not explain the disproportionate number of nonparticipants in urban areas, as a similar location decision presumably faces all specialists regardless of Medicaid practice size. Why, then, are so many nonparticipants found in large metropolitan areas? Is private demand for specialists' services stronger in the largest cities? If this were the case, then why do other urban specialists choose to participate extensively in the program? Furthermore, why don't the incomes of nonparticipants reflect this higher level of demand? Is it possible that these are older physicians, cutting back on caseloads and work effort, and refusing to treat poorer paying, Medicaid patients at the margin? Perhaps the multivariate analysis in Chapter 7 holding confounding factors constant can provide an answer.

The regional distribution of specialists by size of Medicaid practice is shown in Table 5-19. It is important to recognize that these numbers refer to the distribution of each practice type (LMPs, SMPs and nonparticipants) across regions of the country, and not to the distribution of physicians by Medicaid practice size within any one region. Hence, 41 percent of LMP allergists nationwide reside in the North East, but 41 percent of North Eastern allergists are not necessarily LMPs.

According to Table 5-19, LMP specialists are commonly overrepresented in the West and North East relative to their SMP colleagues. Close to twice as many LMP orthopedic surgeons and otolaryngologists as SMPs appear in the West (45% vs. 23%), for instance. Large Medicaid practice dermatologists, gastroenterologists and neurosurgeons are also overrepresented in the West compared with SMPs.

TABLE 5-19

GEOGRAPHIC REGION BY MEDICAID PRACTICE SIZE: SECONDARY SPECIALISTS

	NONE				SMP				LMP			
	N.E.	N.C.	South	West	N.E.	N.C.	South	West	N.E.	N.C.	South	West
Allergy	30.3	18.6	33.4	17.7	31.3	20.3	35.1	13.3	40.6	31.7	7.5	20.2
Cardiology	51.7	8.6	27.7	12.1	27.7	19.8	33.3	19.2	44.5	10.0	25.3	20.2
Dermatology	34.7	16.3	27.2	21.9	26.2	20.8	33.1	19.8	11.9	9.1	43.3	35.6
Gastroenterology	37.2	11.9	28.8	22.1	32.4	17.5	23.5	26.5	27.2	18.6	16.0	38.2
Neurosurgery	17.6	5.8	59.6	17.0	24.9	21.9	29.5	23.6	24.9	12.3	28.1	34.7
Ophthalmology	31.2	20.7	36.6	11.6	28.7	20.5	25.0	25.7	22.2	19.9	30.4	27.5
Orthopedic Surgery	31.9	8.7	32.6	26.7	25.1	19.4	32.7	22.8	27.2	14.1	13.1	45.6
Otolaryngology	39.4	17.8	31.2	11.6	24.0	21.1	32.3	22.6	13.9	10.7	30.3	45.1
Urology	36.7	20.1	35.3	7.8	19.2	20.4	37.5	22.9	32.0	19.8	19.8	28.4

It is possible that we are finding many LMPs in the West because of more generous Medicaid coverage or higher Medicaid fees. Alternatively, greater physician competition may be encouraging participation in the program. Judging from the relatively small proportion of nonparticipants in the West, both of these hypotheses seem reasonable. As for the North East, we find a disproportionate number of LMP allergists, cardiologists and urologists. Fewer than half as many LMP dermatologists as SMPs, by contrast, are residents of the North East.

Finally, we observe several striking differences between the proportion of SMPs and LMPs in the South, although in each case LMPs are underrepresented. While 35 percent of SMP allergists live in the South, merely 7 percent of LMP allergists do. Similarly, less than half as many LMP orthopedic surgeons and urologists as SMPs are Southern.

Table 5-19 also suggests that nonparticipants are located primarily in the South and North East, which together account for between 60-80 percent of all nonparticipating specialists. In fact, almost 60 percent of all neurosurgeons who do not treat any Medicaid patients are located in the South alone, while 52 percent of nonparticipating cardiologists reside in the North East (a majority of nonparticipating cardiologists are urban dwellers, as well). Why are so many North Eastern and Southern specialists opting out of the Medicaid program? Is private demand so strong, or Medicaid participation so distasteful (low fee schedules, payment delays, undesirable patients, etc.) that these physicians can afford to refuse to treat the medically indigent? Only multivariate techniques holding other factors constant can adequately address these hypotheses, but clearly, regional differences are playing a role in the Medicaid specialists' maldistribution.

5.9.2 Practice Size and Organization

The popular imagery of a Medicaid mill is of a large, incorporated practice in which physicians are generating unnecessary "in-house" referrals in order to maximize practice revenues. According to Table 5-20, this is just not the case. Sixty percent of specialists with LMPs are in solo practices, compared to 55% of SMPs. Another 37 percent of LMPs are practices of between 2-5 physicians (versus almost 40% of SMPs), with a small minority, only 3 percent, in practices of six physicians or more. Finally, LMP specialists are actually less likely than their SMP peers to be incorporated (55% vs. 59%), with little difference in the proportion of practices which are prepaid, approximately 3½ percent. In sum, the practice size and organization of large Medicaid practices is not materially different from that of SMPs.

TABLE 5-20

PRACTICE ORGANIZATION BY SIZE OF MEDICAID PRACTICE: SECONDARY SPECIALISTS

	Medicaid Practice Size		
Organization	None	SMP	LMP
Size[a]			
Solo	71.0%	55.1%	60.1%
2-5 MDs	27.6	39.5	36.6
6-9 MDs	1.4	5.4	3.3
Prepaid	1.2%	3.4%	3.7%
Incorporation	45.6	59.0	55.2

[a] Columns sum to 100%.

5.10 Large Medicaid Practice Psychiatrists

Of all the secondary specialists surveyed, psychiatrists have one of the lowest average Medicaid participation rates: 8 percent (see Table 5-2). Two reasons may explain these low rates. First, limited demand for psychiatric services by the Medicaid population, largely composed of children and the elderly who seldom see psychiatrists, may provide an explanation for low rates of participation. Second, program participation may be discouraged by limitations on office-based mental health services which tend to bias benefits towards institutional care. In this section we seek to determine what kinds of psychiatrists do participate extensively in Medicaid, and whether they differ in any systematic way from other psychiatrists. Before continuing with our analysis of LMP psychiatrists, however, the reader should be reminded that the definition of large Medicaid practices employed here differs from that used in our previous work (Mitchell and Cromwell, 1981). While LMP psychiatrists were previously defined as physicians devoting at least 30% of their practice to Medicaid patients, this study uses one standard deviation above the mean percentage of Medicaid patients in a practice as the definition of an LMP. Psychiatrists whose Medicaid caseload exceeds 21.2% of their practice are now considered LMP psychiatrists; hence, this new definition includes somewhat more physicians than that used before. With that in mind, we now turn to a descriptive analysis of large Medicaid practice psychiatrists.

5.10.1 Credentials and Characteristics

Credentials: Large Medicaid practice psychiatrists are not less qualified than their SMP colleagues, according to Table 5-21. There are no differences in rates of board-certification between LMPs and SMPs, for instance. Nor are LMP psychiatrists any more likely to have graduated from a foreign medical school than SMPs; about 13 percent of both groups are FMGs, with 9 percent being Third World FMGs. (Compared to other LMP specialists, LMP psychiatrists are disproportionately FMGs.) Medicaid participants and nonparticipants are different in this respect, however. While 13 percent of participating psychiatrists are FMGs, only 8 percent of nonparticipants are foreign trained. The differences are

TABLE 5-21

PSYCHIATRIST CREDENTIALS AND CHARACTERISTICS BY SIZE OF MEDICAID PRACTICE

Credentials and Characteristics	Medicaid Practice Size None	 SMP	 LMP
Board Certification	48.3%	49.2%	44.6%
Foreign Medical Graduate	8.0	13.3	13.0
Third World Foreign Medical Graduate	3.4	9.3	9.9
No Hospital Affiliation	37.2	22.8	17.2
Age-Forty Years or Younger	22.1	17.6	30.9***
Age-Sixty Years or Older	14.1	12.1	11.6
Sex-Female	11.5	7.5	8.8
Child Psychiatrist	12.6	11.0	22.0***

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

even more striking when we restrict the FMG definition to include only graduates from the Third World: almost three times as many participants as nonparticipants are Third World FMGs (9.4% compared to 3.4%). Given the low rates of participation for psychiatrists generally, these findings suggest that the dichotomous decision whether or not to participate in Medicaid may be more important in understanding psychiatrists' behavior towards the program than the actual degree of participation. We will test this hypothesis empirically in Chapter 7.

Finally, LMP psychiatrists are more likely to be hospital affiliated than their SMP colleagues (only 17% of LMPs lack hospital affiliations compared with 23% of SMPs), which probably reflects the programmatic bias towards institutional forms of care. Nonparticipants are least likely to have hospital affiliations of all Medicaid practice groups with close to 40 percent lacking hospital affiliations.

Characteristics: Table 5-21 suggests that LMPs and SMPs do have somewhat different characteristics. LMPs are disproportionately younger than their SMP peers, for instance. While only 18 percent of SMP psychiatrists are younger than forty years of age, close to one-third of LMPs fall into this age group. It appears that younger psychiatrists who have not yet built up a strong private practice, are being channelled into the Medicaid market due to limited private patient demand. On the other hand, the proportion of LMP and SMP psychiatrists age sixty and over are not materially different. Both of these findings concerning age were consistent with those for the other specialists.

Also of interest was the proportion of LMP psychiatrists who are female. On the one hand, we would expect private demand for women psychiatrists to be lower, implying greater Medicaid participation. On the other hand, women physicians are hypothesized to value leisure time more highly, wishing to spend more time with family and children. If this is the case, women psychiatrists will be less willing to supply visits to lower paying, Medicaid patients, choosing to reduce caseloads instead. According to Table 5-21, there is no difference in the proportion of female psychiatrists in LMPs and SMPs. Again, however, participants as a group differ from nonparticipants. Participating psychiatrists are actually less likely to be female (7.8% of sample) than are nonparticipants (11.5%),

implying that at least some women psychiatrists prefer to trade-off poorer paying, Medicaid patients for leisure time at the margin.

A final characteristic of interest was whether a psychiatrist specializes in the treatment of children.* Because a substantial number of Medicaid recipients are under the age of eighteen, such specialization might be relevant for explaining some psychiatrists' behavior towards the Medicaid program. As evidenced in Table 5-21, a significantly larger proportion of LMPs are, in fact, child psychiatrists. Fully twice as many LMP as SMP psychiatrists specialize in the treatment of children (22% compared to 11%). If private demand for child psychiatrists were low in certain geographic areas, this might explain a greater willingness on the part of these psychiatrists to accept Medicaid patients. Furthermore, coverage of care for children in psychiatric hospitals, an optional service offered by almost two-thirds of state Medicaid programs, should encourage treatment of Medicaid children, ceteris paribus.

5.10.2 Psychiatrist Earnings

Like the majority of LMP physicians, psychiatrists with large Medicaid caseloads earn significantly less than their SMP colleagues, by about 10 percent per annum (see Table 5-22). Net incomes of LMP psychiatrists average $49,154 compared to $54,151 for SMPs. After adjusting for possible differences in work effort, LMPs continue to earn less on an hourly basis than SMPs ($26.61 per hour vs. $30.55), although the difference is no longer statistically significant. One important factor explaining lower earnings in LMPs is low Medicaid fees, which average only about two-thirds of usual fees. Because LMP psychiatrists devote a larger share of their practices to lower paying Medicaid patients, average gross revenues are lower in LMPs.

Incomes of LMP psychiatrists are not as low as we might have expected, however, given their concentration of Medicaid patients. Higher Medicaid payments to LMP psychiatrists, both absolutely and as a proportion of usual fees, lessen the impact of low Medicaid fees on LMP earnings. They also explain, at least in part, the greater willingness of LMP psychiatrists to participate in the public benefits program. According

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*While psychiatrists were not asked directly if they specialize in child psychiatry, this information was inferred from data on board-certification. Hence, child psychiatrists referred to here include only those who are board-certified, and may not strictly correspond to the actual number of psychiatrists specializing in children.

TABLE 5-22

PSYCHIATRISTS' NET INCOMES[a], IMPUTED WAGES AND FEES BY SIZE OF MEDICAID PRACTICE

	Medicaid Practice Size		
	None	SMP	LMP
Net Income	$49,552	$54,151	$49,154*
Imputed Hourly Wage	28.27	30.55	26.61
Usual Fee -- 50 Minute Therapy Session($)	53.41	52.92	52.31
Medicaid Fee -- 50 Minute Therapy Session($)	b	29.38	33.86***
Ratio of Medicaid to Usual Fee	b	0.56	0.64

[a] Adjusted for regional cost-of-living differences; incomes expressed in 1977 dollars, fees expressed in 1978 dollars.

[b] Medicaid fee not asked of nonparticipating psychiatrists.

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

to Table 5-22, LMP psychiatrists receive, on average, $33.86 from Medicaid for a fifty-minute therapy session, compared to $29.38 in SMPs. The ratio of Medicaid to usual fees are also higher in LMPs, averaging 64 percent of stated charges versus 56 percent in SMPs.

To see how relatively higher Medicaid fees in LMPs soften the impact of extensive Medicaid participaton on LMP incomes, consider the following example. Suppose SMP psychiatrists devote approximately 7 percent of their practices to Medicaid patients, and the remaining 93 percent to private patients, for whom they (presumably) receive their usual fee of $52.92. Average visit revenues would therefore be $51.28 for a fifty minute therapy session in SMPs ($52.92*0.93 + $29.38*0.07). Further suppose that LMP psychiatrists, who devote 36 percent of their practices to Medicaid patients and only 64 percent to private patients on average, were to receive for their Medicaid beneficiaries the Medicaid fee in SMPs, or $29.38 per visit. Average gross revenues per visit in LMPs would thus be $44.06 ($52.31*0.64 + $29.38*0.36). Yet LMPs do not receive $29.38 per therapy session from Medicaid; they collect $33.86 instead. Hence, their average visit revenues are $45.67 ($52.31*0.64 + $33.86*0.36), or 4 percent higher than would have been predicted were LMPs and SMPs to receive the same Medicaid fee. If usual fees for the two groups were equivalent, LMPs would be averaging even higher revenues per visit. Thus, while LMPs are penalized by low Medicaid fee schedules, the fact that Medicaid fees constitute a relatively greater proportion of their usual charges reduces the penalty slightly.

5.10.3 Caseload and Work Effort

Given that Medicaid fees for psychiatric visits average only about sixty percent of usual fees, we might ask how LMPs are able to earn incomes averaging as much as 90 percent of those of SMP psychiatrists. We know that relatively higher Medicaid fees in LMPs play some role in closing the gap between LMP and SMP incomes, but they cannot explain this small income differential completely. It is possible that LMP psychiatrists are compensating for low reimbursement levels through greater visit volume, or a different visit mix (e.g. more expensive visits) than SMPs.

Table 5-23 presents the caseload and work effort of psychiatrists by size of Medicaid practice. LMP psychiatrists do not work any harder than SMPs, practicing about 41 hours per week. (Of all the secondary

TABLE 5-23

PSYCHIATRISTS' CASELOAD AND WORK EFFORT BY SIZE OF MEDICAID PRACTICE

Average Weekly Work Effort	Medicaid Practice Size None	 SMP	 LMP
Total Visits	49.2	56.1	63.6*
Total Patient Care Hours	38.7	41.2	41.5
Office Visits	36.0	35.6	41.8***
Office Hours	32.6	32.0	30.8
Length of Office Visit (in minutes)	54.3	53.9	44.1***
Inpatient Hospital Visits	8.4	17.3	17.3
Other Visits[a]	4.4	3.2	4.6

[a] Includes emergency room and clinic visits, house calls and nursing home visits.

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

specialists, psychiatrists work the fewest hours.) They do provide significantly more total visits, however, treating 13 percent more patients than SMP psychiatrists and 29 percent more than nonparticipants. Higher visit volume in LMPs is almost entirely attributable to the provision of significantly more office visits, as inpatient caseloads of small and large Medicaid practice psychiatrists are identical (17.2 visits per week),* and the contribution of other visits to total volume, minimal.

Approximately 42 office patients per week are seen by LMP psychiatrists, compared to only 36 for nonparticipants and SMPs (a 17 % difference). The fact that LMPs have greater office volume with no difference in work effort implies that visits must necessarily be shorter. According to Table 5-23, visit lengths are significantly shorter in LMPs, by about 10 minutes on average (44 minutes compared to 54 minutes in SMPs). If we assume that LMP psychiatrists see their private patients for the same amount of time as do other psychiatrists, this would imply average visits of only 26 minutes for Medicaid patients.

These reported visit lengths do not adjust for casemix variations, however. If LMP psychiatrists are seeing a more seriously ill patient population, for example, they may be substituting shorter drug therapy visits for more traditional psychotherapy visits. They may also be seeing more patients in group (rather than individual) sessions, a practice encouraged by the reimbursement policies of many state Medicaid programs. Unfortunately, no survey data were available on the mix of office visits. In any case, LMP psychiatrists do appear to be compensating for low Medicaid fees through shorter visit contacts, at least to some extent. Whether visits are shortened for all patients, both private and public, or just for Medicaid beneficiaries, could not be determined.

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*Worth noting is the fact that Medicaid participants as a group treat close to twice as many patients on an inpatient basis as nonparticipants, consistent with findings on hospital affiliation. Limitations on ambulatory psychiatric care under Medicaid further encourage hospital admission (President's Commission on Mental Health, 1978).

5.10.4 Practice Location

Like their SMP colleagues, more than half (57.5%) of LMP psychiatrists are found in the largest cities (see Table 5-24). The similarity to SMPs with respect to practice location ends here, however. While less than one quarter of LMPs are located in small cities (versus 45% for SMPs), a disproportionate number are found in rural areas. In fact, LMPs are four and one half times more likely to reside in non-metropolitan areas compared with SMPs (18% vs. 4%). Private psychiatrists may be meeting an unmet demand due to a lack of alternative forms of psychiatric care (mental health clinics, etc.) in rural areas. Furthermore, lower per capita income in these areas may lower private patient demand, forcing psychiatrists to enter the public market sooner than their metropolitan colleagues.

Also presented in Table 5-24 is the regional distribution of psychiatrists by extent of Medicaid participation. LMP psychiatrists are actually underrepresented in the North East, in contrast to other LMP specialists. Whereas 41 percent of nonparticipants, and 31 percent of SMPs are located in the North East, less than one-fifth (18%) of LMP psychiatrists reside there. The largest proportion of LMP psychiatrists are found in the Western part of the country (59%), with a very small proportion found in the South (6%). These findings are probably attributable to: (a) state variations in Medicaid coverage for psychiatric services; and (b) psychiatrist supply. California, for instance, has fairly liberal benefits for psychiatric services (requiring prior authorization only after 8 visits per quarter), while the Southern states tend to be less generous, both in terms of eligibility and coverage (Georgia allows only $250 per patient per year for psychotherapy; Kentucky, only two physician visits per year (MMMI, 1979)). In addition, California ranks sixth highest in psychiatrist to population ratios, while seven of the fifteen lowest ranking states are in the South (Wechsler, 1976). Hence, psychiatrist competition should be relatively higher in the West, dominated by California, thereby encouraging Medicaid participation.

TABLE 5-24

GEOGRAPHIC LOCATION OF PSYCHIATRISTS BY SIZE OF MEDICAID PRACTICE[a]

	Medicaid Practice Size		
	None	SMP	LMP
Location[b]			
Large Metropolitan	73.1%	51.3%	57.5%
Small Metropolitan	23.6	44.7	24.3
Non-Metropolitan	3.2	4.0	18.2
Region			
North East	41.0	31.0	18.2
North Central	18.1	15.6	16.6
South	26.1	29.4	6.3
West	14.8	24.0	58.9

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[a] Columns sum to 100% by county size and by region.

[b] Large metropolitan areas are those with greater than 1.4 million population; small metropolitan areas have between 50,000-1.4 million population.

5.10.5 Size and Organization

Contrary to the stereotypic image of LMPs as large, incorporated practices, LMP psychiatrists are very similar to other psychiatrists with respect to practice size and organization. LMPs are overwhelmingly in solo practices (91%), not unlike their SMP and nonparticipating colleagues, 89 percent and 95 percent of whom are in solo practices, respectively. Another 8 percent of LMPs are in practices of between two and five physicians, compared with 10 percent of SMPs. Psychiatrists in practices with six or more colleagues are practically nonexistent, constituting merely one percent of *all* psychiatrists' practices, regardless of Medicaid caseload.

Approximately 30 percent of LMPs are incorporated, compared with 34 percent of SMPs and 27 percent of nonparticipants. These rates of incorporation in LMPs are quite low relative to those in the other secondary specialties, where twice as many LMPs are incorporated.

6.0 HIGH INCOME LARGE MEDICAID PRACTICES

Because Medicaid fees average only about sixty percent of physicians' stated charges, it is particularly puzzling that any physicians with large Medicaid caseloads earn significantly more than their peers treating fewer (if any) Medicaid patients. Are these the high volume, low quality Medicaid mills maligned in Senator Moss's Congressional testimony? Or are these physicians genuinely more productive and well-trained than other physicians, explaining their higher than average incomes? In this chapter we compare high income, large Medicaid practices (HILMPs) to other practice groupings in an effort to identify the source of the differential in net incomes.

6.1 Size Distribution of Physicians' Incomes: Primary Care

Because of their substantial contribution to rising health care costs, physicians' incomes are of great concern to the public and policymakers alike. Table 6-1 presents the distribution of net incomes in each of the five primary care specialties, adjusted for regional cost-of-living differences and expressed in 1977 dollars. Not surprisingly, mean incomes (shown at bottom) increase with specialization, reflecting returns to background and training. Whereas general surgeons and obstetricians-gynecologists (OB-GYNs) are required to have five years of post-graduate training and experience to qualify for board-certification, pediatricians and internists need only three (Wechsler, 1976). Correspondingly, general surgeons and OB-GYNs, the only surgical specialists in our primary care sample, have the highest net incomes, averaging $72,522 and $70,437, respectively. Pediatricians, by contrast, earn the least of all primary care physicians, $53,603 on average, or only about three quarters of what their surgical colleagues earn.

Variations in net income are not only attributable to physician background and training, but other interspecialty differences as well. Visit mix is a primary source of such variation. Surgical specialists, for instance, perform many more highly paid procedures (such as obstetrical deliveries or operations) than do other primary care physicians, a fact clearly reflected in their incomes. Insurance coverage also has important implications for variations in net incomes. While third party payors almost inevitably

TABLE 6-1

SIZE DISTRIBUTION OF PHYSICIAN INCOMES BY SPECIALTY: PRIMARY CARE

Income Category[a]	General Practitioners	General Surgeons	Internists	OB-GYNs	Pediatricians
≤ $20,000	7.8%	3.3%	2.4%	3.5%	5.7%
$20-30,000	8.9	5.1	8.4	3.4	7.9
$30-40,000	7.5	5.9	8.4	7.6	12.6
$40-50,000	14.0	8.3	13.5	9.0	18.1
$50-60,000	28.7	8.1	20.1	12.0	24.9
$60-70,000	13.9	20.3	24.9	18.6	14.1
$70-80,000	5.8	18.4	8.3	18.2	6.4
$80-90,000	3.4	8.0	3.9	10.4	3.7
$90-100,000	4.1	7.9	4.7	6.4	4.4
$100-110,000	2.7	5.6	2.9	3.3	1.4
$110-120,000	0.5	2.3	1.3	2.0	0.2
$120-130,000	0.2	3.6	0.4	2.0	0.1
$130-140,000	0.9	0.9	0.2	1.3	0.1
$140-150,000	0.1	0.7	0.1	0.6	0.0
$150-200,000	1.2	1.2	0.4	1.2	0.4
$200,000 +	0.2	0.6	0.2	0.4	0.0
Mean Income	$56,668	$72,522	$59,788	$70,437	$53,603

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[a] All incomes expressed in 1977 dollars, and adjusted for regional cost-of-living differences.

cover physicians' services in the hospital, coverage for office-based care is less common. Hence, physicians spending relatively more time practicing in hospitals (OB-GYNs, general surgeons, and to a lesser extent, internists) would be expected to earn higher incomes (and be subject to fewer bad debts) than those spending less time outside the office. This insurance effect seems particularly relevent in the case of pediatricians, for whom office-based coverage is rarely extended. Added to a changing age distribution of the population, which shows a decline in the relative proportion of young people, it is not surprising that pediatricians have the lowest average incomes of all primary care physicians.

The proportion of physicians with unusually high (or low) incomes will also vary widely by specialty, of course. About 44 percent of all pediatricians have incomes of $50,000 or less, compared to 37 percent of GPs and 33 percent of internists. Fewer than one quarter of surgical specialists' incomes do not exceed $50,000. At the upper end of the income spectrum, OB-GYNs and general surgeons are disproportionately represented. Approximately 31 percent and 27 percent of general surgeons and OB-GYNs, respectively, have net incomes in excess of $80,000, versus only about 13 percent of GPs and internists, and ten percent of pediatricians. And whereas 15 percent of general surgeons have incomes over $100,000, merely 2.2 percent of pediatricians earn comparable incomes.

Figure 6-1 depicts the size distribution of net income graphically by specialty. All the distributions are similarly shaped, showing a strong rightward skew, but the modal net income of general practitioners and pediatricians was $10,000 lower than that of other physicians, or $55,000 compared to $65,000. Mirroring the pattern seen in Table 6-1, the distributions fall off quite sharply after peaking, particularly for GPs and pediatricians. Net incomes of the surgical specialists follow a somewhat more normal distribution, with many fewer physicians at the lower end, although a notable rightward skew still remains.

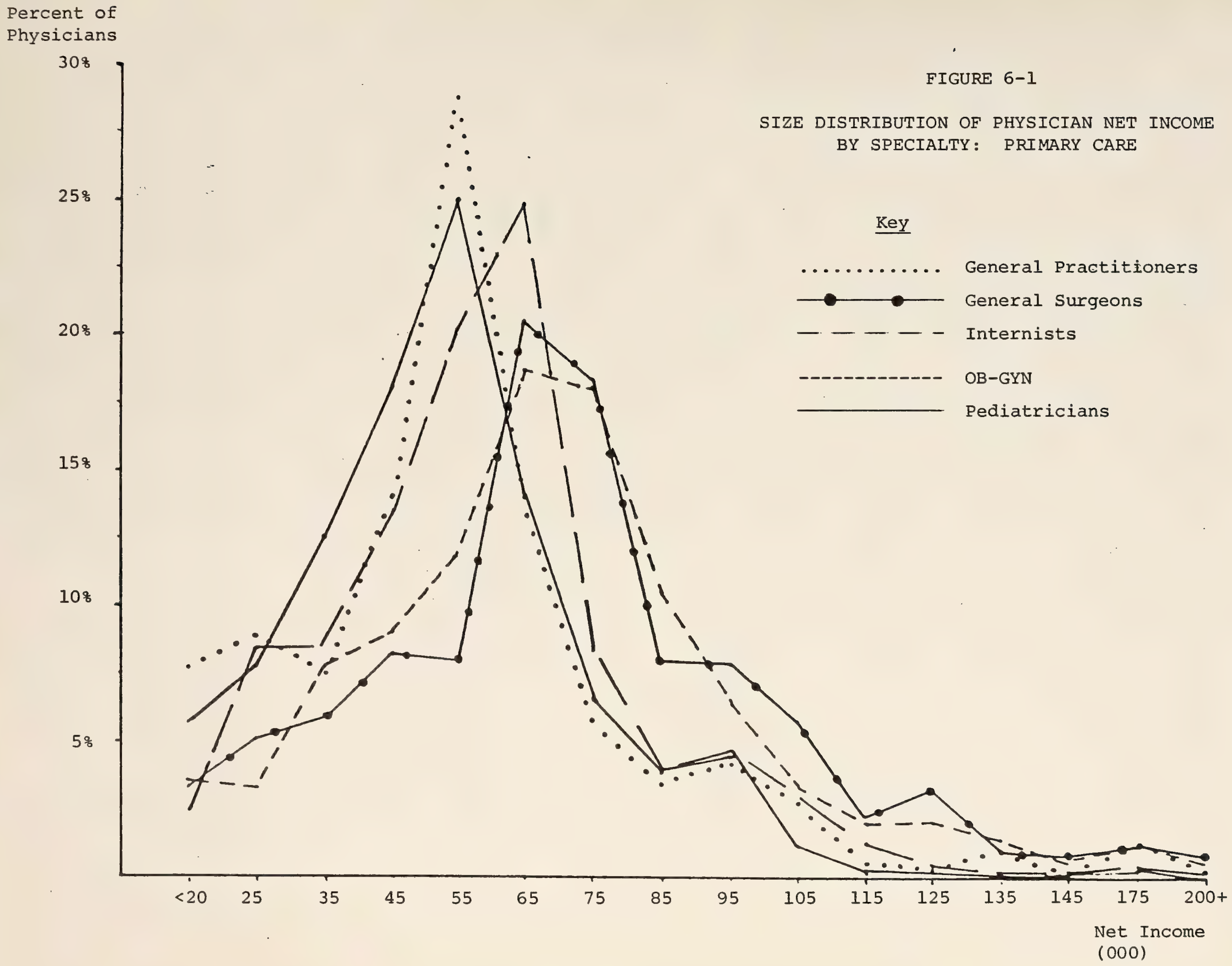

FIGURE 6-1

SIZE DISTRIBUTION OF PHYSICIAN NET INCOME
BY SPECIALTY: PRIMARY CARE

6.2 Definition and Sample Size: High Income Large Medicaid Practices

Given that many primary care physicians earn unusually high incomes, it would be interesting to take a closer look at those who participate extensively in the Medicaid program. For our purposes, high income large Medicaid practices are defined as LMPs with net incomes of $80,000 or more.* Comparison groups will include: (1) other high income physicians with smaller Medicaid practices (HISMPs); (2) other large Medicaid practices with incomes of less than $80,000 (LOLMPs); and (3) all SMPs and nonparticipants combined, regardless of income (SNMPs).** This last group, by far the largest in size, represents the "average" physician practice, and is the primary reference group for HILMPs. All significance testing contrasts HILMPs with this group.

Unweighted sample sizes for the four practice groupings are shown below:

Practice Grouping		# of observations (unweighted)
High Income Large Medicaid Practices	(HILMP)	115
Low Income Large Medicaid Practices	(LOLMP)	507
High Income Small Medicaid Practices	(HISMP)	617
All SMPs and Nonparticipants	(SNMP)	3756

HILMPs are about 18 percent of all primary care large Medicaid practices (or about 1 in 6), while HISMPs constitute a somewhat higher proportion of all small Medicaid practices, 22 percent. Of the 115 (unweighted) high income LMPs, there were 20 GPs, 34 general surgeons, 13 internists, 43 OB-GYNs, and only 5 pediatricians. Given these small sample sizes, particularly for pediatricians and internists, specialty-specific findings should be interpreted with caution.

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*Large Medicaid practices, it should be recalled, are defined as practices with more than one standard deviation above the mean percentage of Medicaid patients for each specialty.

**As high income small Medicaid practices are also included in this group, the practice groupings are not mutually exclusive.

6.3 Incomes and Wages

By definition, HILMP physicians have extraordinary incomes. But exactly how much more than other physicians do HILMPs earn? Table 6-2 presents mean incomes by specialty for each of the four practice groupings. HILMPs do earn substantially more than the average physician, about $41,500 more on average, although this varies considerably by specialty. HILMPs in general surgery, for instance, earn only $28,000 more than their SNMP colleagues (a 39% difference), compared to a difference of almost $52,000 (or 90%) in general practice. The absolute magnitude of HILMP physicians' net incomes is phenomenal, ranging from an average of $97,716 for pediatricians to $109,082 for GPs. It is particularly noteworthy that general practitioners have the highest mean incomes of all HILMPs since they are the least specialized of all the primary care physicians. The fact that they are HILMPs in the first place, however, suggests they are quite a unique group.

Relative to other LMP physicians, mean incomes of HILMPs seem even greater. Incomes of LOLMPs average less than half (49%) of HILMP incomes (compared to 82% of SNMPs incomes), reflecting the impact of low Medicaid fees. Again the difference is most pronounced in general practice, where net incomes of LOLMP physicians constitute merely 44 percent of HILMPs' annual earnings.

Mean net incomes of all high income physicians, however, regardless of Medicaid practice size, are not materially different ($104,648 compared to $102,946). HISMP general surgeons do average about 8 percent more than HILMPs, but we would expect physicians with smaller Medicaid practices to earn more. It is surprising that HILMP general practitioners and internists can actually earn more than their HISMP colleagues, however, given their greater reliance on Medicaid fees. While the differences are not large (only about 4%), these findings are certainly contrary to expectations.

Table 6-2 also presents physicians' imputed hourly wages, adjusting for possible differences in work effort. HILMPs continue to earn significantly more on an hourly basis than most physicians, 61 percent more on average ($43.20 vs. $26.79). The largest disparities in wages appear in pediatrics and general practice, where HILMPs earn close to twice as much as SNMPs.*

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*As the sample size of HILMP pediatricians is very small, findings for this group should be interpreted cautiously.

TABLE 6-2

NET INCOMES[a] AND IMPUTED HOURLY WAGES: HILMPs VS. OTHER PRIMARY CARE PHYSICIANS

Specialty	SMPs and Nonparticipants	HISMP	LOLMP	HILMP
Net Income-All	$61,429	$104,648	$50,315	$102,946***
(Imputed Wage)	($26.79)	($42.69)	($21.83)	($43.20)***
General Practitioners	57,136	105,168	48,318	109,082***
	(24.80)	(42.12)	(20.01)	(45.66)***
General Surgeons	71,914	108,074	51,136	100,098***
	(30.84)	(46.24)	(21.09)	(44.52)***
Internists	59,288	99,933	52,753	104,093***
	(26.27)	(41.33)	(25.33)	(40.73)***
OB-GYNs	69,737	103,549	58,753	102,301***
	(30.26)	(39.71)	(24.56)	(40.46)***
Pediatricians	54,120	96,385	45,054	97,716***
	(24.39)	(37.16)	(20.06)	(47.66)***

[a] Expressed in 1977 dollars; adjusted for geographic cost-of-living differences.

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

The fact that imputed physician wages vary directly with income suggests that HILMPs are not working notably harder than their SNMP or LMP colleagues, although other factors (demand, physician credentials, etc.) may explain their high hourly earnings. High hourly wages may be attributed to strong exogenous demand or outstanding credentials and training. To determine whether these factors do explain the extraordinary wages of HILMPs, the residuals from the wage equation presented earlier (see Section 4.1.4) were grouped into the four practice categories and compared, as shown in the text below:

Group	N	Mean Residual($\bar{r}$)	$t(\hat{\bar{r}})=0$
HILMP	111	13.50	8.7
LOLMP	503	-3.70	-8.7
HISMP	610	13.87	20.0
SNMP	3715	0.11	0.5

The residual for the HILMP group was positive and significant from zero$^{(t=8.7)}$, implying that even when physician credentials, age, competition and demand are held constant, HILMPs still earn considerably more than their SNMP colleagues, whose mean residual was not different from zero. Other LMP physicians, by contrast, have hourly wages significantly below those of the average physician, consistent with the hypothesized effect of low Medicaid fees. Not surprisingly, imputed hourly wages of HILMPs and HISMPs are quite comparable, with highly significant mean wage residuals of 13.50 and 13.87, respectively.

6.4 Physician Credentials and Characteristics

The specialty mix and credentials of HILMPs are compared with those of their colleagues in Table 6-3. HILMPs are more specialized than all of the comparison groups, including other high income physicians with smaller Medicaid practices. Relative to SNMPs, HILMPs are twice as likely to be general surgeons, and not nearly as often in general practice (only 18% of HILMPs are GPs versus 40% of SNMPs). Another difference in the specialty mix of the two groups, consistent with earlier findings on the size distribution of net income, is in the proportion of OB-GYNs and pediatricians. While pediatricians constitute 9 percent of SNMPs, they are only 4 percent of HILMPs. OB-GYNs, by contrast, are overrepresented in HILMPs: twenty

TABLE 6-3

PHYSICIAN CREDENTIALS AND TRAINING: HILMPs VS. OTHER PRACTICES[a]

	SMPs and Nonparticipants (3759)	HISMP (549)	LOLMP (513)	HILMP (130)
General Practitioner	40.3%	32.7%	45.5%	18.0%
General Surgeon	17.0	32.0	12.3	35.8
Internist	20.6	14.2	24.7	22.2
OB-GYN	12.8	16.1	8.2	20.0
Pediatrician	9.2	5.0	9.3	4.0
Board Certification	44.2	54.7	28.7	39.6
Foreign Medical Graduate (FMG)	11.4	6.8	21.0	17.4**
Third World FMG	7.5	3.9	12.7	6.2
No Hosp. Affiliation	2.9	2.6	2.7	1.4
Younger than 40 yrs.	16.3	21.8	11.7	27.6***
Sixty Years or Older	25.1	12.1	28.9	16.0**

[a] Numbers in parantheses are weighted sample sizes. HISMP sample is subset of SMP/nonparticipant sample.

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

percent of HILMPs are OB-GYNs compared to 13 percent of SNMPs. In order to control for such specialty differences between HILMPs and SNMPs, the following descriptive analyses will provide specialty-adjusted measures, when necessary, to make the groups more comparable. The specialty-adjustment consists of applying the relative specialty mix of the SNMP group to within-specialty measures for HILMPs.

According to the bottom half of Table 6-3, even though GPs are under-represented, HILMPs are less often board-certified than their SNMP colleagues, although not significantly so (39.6% compared to 44.2%). These lower rates of board-certification are of great concern, suggesting that while HILMPs may be calling themselves specialists, they are not recognized as such by their respective certifying boards. The discrepancy between specialty mix and board certification is even more apparent when we compare HILMPs with HISMPs. Like their high income counterparts, 55 percent of whom are board-certified, we would expect HILMPs to be better qualified than the average physician. But this clearly does not appear to be the case.

In addition to lower board-certification rates, HILMPs are also significantly more likely than SNMPs to be trained in foreign medical schools (but less likely to be Third World FMGs). Seventeen percent of HILMPs are FMGs, while only 11 percent of SNMPs are trained abroad, a highly significant difference. Compared to their high income colleagues, the difference is even more striking: two and one half times as many HILMPs as HISMPs are foreign medical graduates.

HILMPs are also disproportionately younger than their small Medicaid practice and nonparticipating counterparts, similar to findings for the secondary specialists. More than one quarter (28%) of HILMPs are under forty years of age, compared to 16 percent of SNMPs. At the other end of the spectrum, physicians aged sixty or older, are underrepresented in HILMPs, with the proportions practically reversed (25% of SNMPs fall into this age category vs. 16% of HILMPs). HILMPs more closely resemble other high income physicians in this respect, 22 percent of whom are under forty and only 12 percent over sixty.

There are several possible explanations as to why such a substantial proportion of relatively young physicians are able to earn these extraordinary incomes. First, there has been a growing trend toward specialization (AMA, 1977, Wechsler, 1976), reflected in the specialty choices of recent medical graduates. This tendency toward greater specialization should raise the average incomes of young physicians relative to those of their older colleagues. Second, the demand for young physicians trained in the newest technologies may be greater, enhancing their ability to command higher fees (although this would also suggest lower Medicaid participation). Finally, certain reimbursement policies, such as the CPR method (customary, prevailing and reasonable) used by Medicare and some Medicaid programs, tend to favor physicians just starting out in practice (who are by-and-large young and fresh out of a residency program) by awarding them the median charge level for their Medicare locality. Although the physician's customary charges are recalculated after actual charge data have been collected, this system reimburses new physicians at a level higher than that received by half the already established physicians in that locale. Furthermore, there is a built-in incentive to raise usual fees to ensure higher CPR payments in the future. As a result, younger physicians who accept Medicare patients on assignment and/or treat Medicaid recipients may not be as penalized by low public program fees as their older colleagues.

In sum, while more specialized than the average primary care physician, HILMPs actually have less experience and training. HILMP physicians are disproportionately younger, less commonly board-certified, and more likely to be FMGs than their SNMP peers. They also have notably fewer credentials than other physicians with comparable incomes yet smaller Medicaid practices. Of all large Medicaid practice physicians generally, however, HILMPs are the best qualified. HILMPs have higher board-certification rates, are less likely to be FMGs (and TWFMGs) and have higher rates of hospital affiliation than the average LMP physician.

How are HILMPs generating such incomes, given their lack of experience and credentials? Is it through greater practice volume or a different visit mix than other physicians? Or are HILMPs skimping on practice inputs in order to reduce practice costs and increase net revenues? Perhaps HILMPs are just more productive than their colleagues, able to

utilize auxiliary personnel more effectively. Each of these tentative hypotheses will be explored more thoroughly in the following sections.

6.5 Caseload and Work Effort

As evidenced in Table 6-4, HILMP physicians do provide significantly more visits *in toto* than their SNMP colleagues, averaging 210 visits per week, compared to 171, a difference of 23 percent. After adjusting for specialty mix, this disparity becomes even greater, with total visits for HILMPs increasing to 238 visits per week, 39 percent more than SNMPs. To achieve this higher visit volume, we find HILMPs supplying more of all types of visits with the exception of house calls.* Office visits and hospital visits contribute roughly equally to HILMPs' heavier caseloads. HILMPs supply about 38 percent more office visits per week than SNMPs (149/109), and 31 percent more inpatient visits. Another form of inpatient care, emergency room visits, are provided at twice the rate by HILMPs (14.5/7.3), and operations are performed with greater frequency as well (3.5/3.0). A much larger number of nursing home visits in HILMPs (7.7 compared to 3.1) widens the gap even further.

Although HILMPs are supplying considerably more visits than their SNMP peers, they do not appear to be working notably harder. HILMPs do practice slightly more hours per week than SNMPs (about 2 hours longer, on average), but certainly not enough to explain their heavier caseloads. Some portion of the volume difference between the two groups may be due to the provision of more inpatient and ER visits by HILMPs, which generally require less time than the average office visit. Yet visit mix cannot explain such a large difference in physician productivity. As shown in Table 6-4, shorter physician/patient contacts are at least part of the answer. HILMPs spend significantly less time with their office patients (who constitute more than half their practice) than nonparticipating and smaller Medicaid practice physicians (16.3 minutes compared to 20.4 minutes).** When adjusted for specialty mix, HILMP office visits become even shorter, averaging only 15 minutes -- one quarter less time than is spent with patients in SNMPs. Rather than treating three patients per hour as do SNMPs, HILMPs average four patients hourly, possibly jeopardizing the quality

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*Although HILMPs actually supply significantly fewer house calls, this visit type constitutes less than 1% of a physician's practice.

**See Chapter 5 for a discussion of how office visit lengths were determined and the problem of "down time".

TABLE 6-4

PHYSICIAN CASELOAD AND WORK EFFORT: HILMPs VS. OTHER PRACTICES

Caseload and Work Effort	SMPs and Nonparticipants	HISMP	LOLMP	HILMP	HILMP[a]
Total Visits	170.9	210.8	176.1	210.2***	238.1
Total Patient Care Hours	51.4	55.2	51.0	53.2	53.4
Office Visits	108.7	122.7	115.8	119.2**	149.5
Length of Office Visit (minutes)	20.4	16.1	19.8	16.3**	15.0
Inpatient Visits	47.2	67.2	40.6	64.2***	62.0
Operations	3.0	5.6	2.7	5.2***	3.5
Emergency Room Visits	7.3	11.3	11.1	16.8***	14.5
Nursing Home Visits	3.1	2.8	5.0	4.2	7.7
House Calls	1.5	1.2	1.0	0.6**	0.9

[a] Adjusted for specialty mix by weighting the HILMP group by the specialty distribution of SMPs and nonparticipants combined (column 1).

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

of care in these practices. One possible explanation for these differences may be that HILMP physicians are behaving more like GPs, treating a less serious casemix and referring more complex and time-consuming cases to other specialists. Yet because Medicaid patients are expected to be sicker if anything (often having waited longer before seeking medical attention), this hypothesis seems improbable. Hence, heavier caseloads and shorter visit contacts, while explaining the extraordinary incomes of HILMPs, are suggestive of assembly-line, poor quality care.

It is interesting that while HILMPs differ considerably from the average physician with respect to caseload and work effort, they are very much like HISMPs. Both supply the same number of visits in toto (about 210 per week), although the visit mix for the two groups varies slightly (HISMPs generate a few more office and inpatient visits; HILMPs spend more time in the emergency room). HISMPs do work slightly longer hours than HILMPs but the difference is minimal (merely 2 hours). Finally, the average duration of an office visit is practically identical for all high income physicians, about 16 minutes. Such similarities between the high income groups suggest that heavier caseloads and shorter visit lengths are not unique to HILMPs, and that perhaps these other high earners deserve closer public scrutiny as well.

6.6 Ancillary Services

One way that physicians with large Medicaid caseloads can offset lower Medicaid visit fees is through unnecessary use of ancillary services, which are reimbursed separately from the physician visit itself. Determining what constitutes "unnecessary", however, is complicated by two factors: (1) variation across specialties in the frequency with which ancillaries are ordered, and (2) casemix variation. The first problem, interspecialty variation, can be overcome by adjusting the specialty composition of HILMPs to correspond to that of SNMPs, the comparison group. The possibility of systematic variation in diagnostic casemix, i.e., that Medicaid recipients may be sicker than other patients and hence require more ancillaries, cannot be eliminated completely, however. While holding specialty constant is the first step in controlling for casemix, variations within specialty may remain. Unfortunately, the HCFA-NORC physician survey did not collect the data required to adjust for diagnostic casemix.

Table 6-5 compares HILMPs with other physician practices in the use of four basic ancillary services: laboratory testing, x-rays, office surgery and injections. Relative to their SNMP colleagues, HILMPs order significantly more of all types of ancillary services. Some of this difference is, of course, attributable to specialty. Yet even after adjusting for specialty differences between the two groups, several important discrepancies remain.* HILMPs give injections to significantly more of their patients than do SNMPs, 28 percent versus only 19 percent, a difference that is even more pronounced once specialty mix is held constant. (In fact, all LMP physicians regardless of income give injections at a higher rate than other physicians, suggesting that Medicaid casemix may differ systematically from other patient groups.) Laboratory tests are prescribed with notably greater frequency in HILMPs as well, recommended for 41 percent of their patients compared to 35 percent in SNMPs. While rates of office surgery and x-ray utilization are also greater in HILMPs, adjusting for specialty mix reduced the difference between the two groups substantially (by about one-half), although a 25 percent discrepancy remains unexplained.

In addition to the questions on ancillary services included in the NORC physician survey, physicians were also asked whether they internalized laboratory testing, and, if so, whether they owned or rented an autoanalyzer. Eighty-one percent of HILMPs (specialty-adjusted) responded that they did do their own laboratory testing, but of these physicians only 3 percent owned or rented an autoanalyzer. While the proportion of SNMPs who internalize laboratory work was somewhat smaller (73%), three times as many SNMP respondents had autoanalyzers in the office (9%). Interestingly enough, while low income LMPs are the least likely of all physician groups to internalize laboratory work (61% of LMPs responded affirmatively to this question), almost one out of three who do have autoanalyzers.

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*Adjusting for specialty increases the proportion of patients given injections in HILMPs, while lowering x-ray utilization and office surgery. The effect of this specialty adjustment on ancillary utilization is quite consistent with what we would have predicted, as the relative importance of GPs and pediatricians in HILMPs (who generally give more injections but take fewer x-rays and do less office surgery) is being increased, while the influence of general surgeons and OB-GYNs is lessened. (See Table 6-3 for the specialty mix of the two groups.)

TABLE 6-5

ANCILLARY UTILIZATION BY INCOME CLASS: HILMPs VS. OTHER PHYSICIANS

Ancillary Service	SMPs and Nonparticipants	HISMP	LOLMP	HILMP	HILMP[a]
Laboratory Tests	35.5%	35.4%	36.1%	41.7%**	41.1%
Office Surgery	4.3	7.3	3.4	6.0**	5.1
X-rays	13.0	13.6	14.3	20.7***	17.1
Shots	18.9	16.8	28.2	22.7**	27.8
Does own Labwork	72.9	70.0	61.5	79.1	81.0
Owns(rents) Autoanalyzer	9.4	13.9	19.7	4.6	3.2

TABLE 6-6

AUXILIARY STAFF[b]: HILMPs VS. OTHER PRACTICE GROUPINGS

	SMPs and Nonparticipants	HISMP	LOLMP	HILMP	HILMP[a]
Total	1.93	2.32	2.02	2.55***	2.96
Clerks	1.11	1.35	1.13	1.66***	1.89
RNs	0.30	0.33	0.33	0.22*	0.22
LPNs	0.20	0.27	0.30	0.25	0.33
Physician Assistants	0.25	0.32	0.22	0.32	0.35
Technicians	.05	0.06	0.04	0.09*	0.17
Total Physician Hours	51.4	55.2	51.0	53.2	53.4

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[a] Adjusted by the specialty mix of SMPs and nonparticipants combined.

[b] Expressed in full-time equivalents per physician.

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

Compared to other, high income physicians, HILMPs again appear to order notably more laboratory tests, x-rays and shots. On the other hand, HISMPs performed more office surgery, recommending surgery for 7.3 percent of their patients compared to 6.0 percent in HILMPs (and only 4.3% in SNMPs). This is quite interesting in and of itself, as we would have expected HILMPs to perform more office surgery, given the greater proportion of surgical specialists in their ranks (56% of HILMPs are general surgeons or OB-GYNs vs. 48% of HISMPs). Greater rates of office surgery in both high income groups are consistent with their higher than average incomes, however.

In sum, HILMPs do seem to be generating some portion of their higher incomes through widespread use of ancillary services and internalization of laboratory work, as well as simply having more "throughput". Unless casemix can be held constant, however, it is difficult to discern how much of this ancillary utilization is actually unnecessary. The fact that all LMP physicians rely heavily on injections and immunizations suggests that there may be casemix differences between Medicaid and the general population, e.g., young children requiring immunizations and the aged needing vitamin and other injections to control chronic illnesses.

6.7 Auxiliary Staff

Another way physicians can raise their incomes is through effective use of auxiliary personnel, enhancing productivity in the practice. Yet policy makers have voiced concern over the use of auxiliary staff in large Medicaid practices for several reasons. First, LMPs may attempt to substitute less-qualified medical personnel (such as RNs or physician assistants) for physician time, a practice clearly having negative implications for quality of care. Second, LMPs may choose to skimp on labor inputs in an effort to reduce practice costs, thereby increasing net revenues. And finally, LMPs may not differ from other physicians in the total number of auxiliary staff employed, but may employ more clerical and less medical personnel to handle billing and collection.

HILMPs do employ significantly more personnel than the average physician, 2.5 full-time equivalents (FTEs) compared to 1.9 for SNMPs (see Table 6-6). Given the fact that general surgeons and OB-GYNs, who constitute more than half the HILMP sample, generally have fewer non-physician employees than more office-based physicians,* adjusting by specialty mix only widens the gap, with HILMPs employing over 50 percent more FTEs than their SNMP colleagues (2.96/1.93). As seen in Table 6-6, this difference is largely attributable to the employment of more clerical personnel, seventy percent more to be exact (1.9 clerk FTEs versus 1.1) And although HILMPs use more medical personnel overall (0.90 FTEs compared to 0.75 in SNMPs), HILMPs actually employ fewer RNs. Consistent with earlier findings on the greater internalization of laboratory services in HILMPs, HILMPs also use three times as many technicians as their peers (0.17/0.05), although on average the rate is quite small.

Clearly, not only the absolute number but the relative mix of personnel also differs between HILMPs and SNMPs, as hypothesized. While clerical personnel constitute 64 percent of the auxiliary staff in HILMPs, they account for 57 percent of total FTEs in SNMPs. Technicians are also relatively more important in HILMPs (6 % of personnel vs. 3%). By contrast, medical personnel are more prominent in SNMPs, constituting nearly 40 percent of their non-physician staff yet only 30 percent of all FTEs in HILMPs.

HILMPs differ from other, high income physicians in personnel mix as well. While both high income groups have more FTEs overall than the average physician, HISMPs are much more like SNMPs than HILMPs in terms of the relative mix of auxiliary personnel. Of course, HISMPs are considerably more specialized than SNMPs, but adjusting for specialty differences should not greatly affect the mix of personnel.

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*Surgical specialists tend to hire fewer auxiliary staff for two reasons. First, surgical specialists spend a greater portion of their time practicing in hospital settings where support staff come as a free practice input. Second, substitutability of medical personnel for physician time decreases with specialization, i.e., RNs are not qualified to perform operations but are able to provide much of the routine care sought from a general practitioner.

In sum, HILMPs are not skimping on labor inputs as a whole; to the contrary, they employ significantly more auxiliary staff than other physicians. Nor do HILMPs appear to be substituting medical personnel for their own time, at least not to any greater degree than their colleagues. (The relatively large number of RNs and PAs in HISMPs suggest that this may be occurring in other high income practices, however.) What does make HILMPs stand out from other physicians is the number and type of personnel they do choose to employ. Clerical and technical staff are notably more important in HILMPs, suggesting that these employees are in some way contributing to the outstanding incomes of HILMP physicians, possibly by increasing practice productivity, although the impact this has on the quality of care is unknown.

To determine whether HILMPs do, in fact, make more effective use of auxiliary staff, productivity levels (measured as visits per patient care hour) in HILMPs and SNMPs are compared in Table 6-7. Consistent with findings for the secondary specialists, productivity increases with the number of aides employed. Practices with fewer than one FTE produce the least number of visits per patient care hour (only 2.7 averaged across all specialties), while practices with three or more aides generate the most (about 4.1 visits/hour).

Regardless of the number of aides employed, HILMPs do appear to be more productive than SNMPs, at least on average (providing 0.6 more visits more per hour). Actual differences in productivity vary widely by specialty, however, ranging from as little as one-tenth of a visit for internists and OB-GYNs to as many as two visits more per hour for GPs with HILMPs (see Total column). In fact, this group is the most productive of all physicians, averaging 5.7 patients an hour. Given the personnel mix in HILMPs (i.e., more clerks), it seems that these physicians devote the time freed from administrative tasks to squeezing in more patients rather than spending more time with each, as evidenced by shorter office visit lengths. Were HILMPs to employ fewer clerks, visit lengths in these practices might become even shorter, if the physician spent more time in billing and collecting from Medicaid.

TABLE 6-7

IMPACT OF AUXILIARY STAFF ON PHYSICIAN PRODUCTIVITY[a] IN HILMPs VS. ALL SMPs AND NON PARTICIPANTS (SNMPs)

	Number of Aides per MD									
	0.0-0.9		1.0-1.9		2.0-2.9		3.0+		Average	
Specialty	SNMP	HILMP	SNMP	HILMP	SNMP	HILMP	SNMP	HILMP	SNMP	HILMP
General Practitioners	2.7	--	3.7	4.1	3.9	5.7	4.4	6.4	3.7	5.7
General Surgeons	2.9	2.7	2.7	4.0	2.9	4.9	3.9	3.6	2.9	3.9
Internists	2.3	2.2	2.8	2.5	3.2	3.8	3.4	3.6	2.9	3.0
OB-GYNs	2.6	3.1	2.9	3.2	3.1	2.6	3.3	3.4	3.0	3.1
Pediatricians	3.1	--	3.8	4.5	3.7	--	3.9	4.4	3.6	4.4
All Physicians	2.7	2.7	3.2	3.5	3.5	4.2	4.0	4.3	3.3	3.9

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[a] Measured as visits per patient care hour.

6.8 Discriminant Analysis of HILMPs, LOLMPs and HISMPs

HILMPs clearly earn more than other large Medicaid practice physicians, but do they differ from their LMP peers in ways which affect the quality of care? While preliminary descriptive analysis suggests that there are distinct differences in credentials and training, caseload, ancillary utilization and auxiliary staff, none of our analytic work thus far has held other factors (besides specialty) constant while comparing LMP physicians. Furthermore, many of these characteristics are intercorrelated (such as specialty, board-certification and physician age), a problem which cannot be adequately controlled for with crosstabular analysis. If HILMPs are uniquely different from other LMP physicians, then a discriminant function including these variables should distinguish them from one another.

A second, yet equally interesting comparison can be made with other high income physicians (HISMPs). Given that all high income physicians are identified by their conspicuous incomes, and hence necessarily differ from the average physician, HISMPs provide a more rigorous test of unusual behavior in HILMPs. Of primary interest here is along what characteristics and practice dimensions can HILMPs be differentiated from high income physicians generally? And furthermore, what implications might these differences have for the quality of care in HILMPs?

Discriminating Variables: Three sets of discriminating variables are included: process measures of quality, credentials and wages. (The same set of variables are used in both functions.) Wages are imputed from weekly work effort (total hours worked) and net incomes. While wages will clearly distinguish HILMPs and LOLMPs, almost by definition, their ability to differentiate the two high income groups is unknown.

Process Measures: If HILMPs tend to be mills, then they should be characterized by lower quality care on all dimensions. In particular, physicians in these practices should spend less time with patients, order more ancillary services, and employ fewer aides. The variable LOV is the length of time spent with each office patient, measured in minutes. The variables TESTS, SHOTS, XRAYS, and SURG are specified as the percent of office patients for whom the physician ordered laboratory tests, injections, x-rays, and office surgery, respectively. AIDE is the number of auxiliary staff employed in the practice, and is expressed as full-time equivalents per physician.

Credentials: Physician credentials include specialty, board-certification, FMG status, age, and hospital affiliation. These variables are included in part as adjustments for the process measures; variations in ancillary utilization between groups may reflect differences in specialty mix. Specialty is specified as four dummy variables, GS, IM, OB, and PED for general surgeons, internists, OB-GYNs, and pediatricians, respectively. General practitioners constitute the omitted category. BOARD and TWFMG both assume the value one if the physician is board-certified, or if he is a Third World FMG. HOSPAFL is also a dummy variable, equal to one if the physician does have hospital affiliations. Age and age-squared (MDAGE and MDAGESQ) are continuous variables, measuring obsolescence of skills and medical knowledge.

Analytic Method: Discriminant analysis is used to distinguish between HILMPs and LOLMPs, and HILMPs and HISMPs. A discriminant function is derived that separates the two groups as much as possible, as measured by a multivariate F-ratio. The standardized discriminant coefficients can be interpreted in much the same way as beta weights from a regression equation. The signs, magnitude, and statistical significance of these coefficients indicate their relative importance in distinguishing between the two groups. The overall success of the discriminant function in separating the two groups is measured by Wilks' lambda (λ), which can range from zero to one; the smaller lambda is, the better the discriminating power of the function. A second measure of the function's ability to discriminate between the two groups is its associated canonical correlation (R_c); the higher the square of this correlation, the greater the variance in the function explained by the groups.

Empirical Findings: Variable means and standardized coefficients for the two discriminant functions are presented in Table 6-8. The first column corresponds to the HILMP/LOLMP comparison, and the second column to the HILMP/HISMP comparison. Negative signs are associated with lower or smaller values for the practice type to the right of the slash at the head of the columns. HILMPs clearly differ from other LMP physicians in many ways; of all the discriminating variables included in the function, only TWFMG was insignificant. Higher imputed hourly wages was the most important distinguishing characteristic of HILMPs, as expected. Relative to their LOLMP colleagues, HILMPs are found to spend significantly less time with patients yet

TABLE 6-8

DISCRIMINANT ANALYSIS OF HILMPs, HISMPs AND LOLMPs

Variables	Discriminant Functions		Means		
	HILMP/LOLMP	HILMP/HISMP	HILMP[a]	LOLMP	HISMP
MDWAGE	-0.85***	0.02	42.62	21.80	42.38
LOV	0.06**	-0.01	16.63	19.97	16.37
TESTS	-0.30***	-0.15***	44.70	36.20	36.02
SHOTS	0.18***	-0.17	17.74	28.32	16.98
XRAYS	0.06***	-0.33***	19.39	14.29	13.63
SURG	0.12**	0.45**	4.73	3.43	7.38
AIDE	-0.27***	-0.29*	2.64	2.02	2.31
BOARD	-0.03***	0.52*	0.46	0.29	0.56
TWFMG	-0.04	-0.10	0.07	0.13	0.04
MDAGE	-0.40**	-0.61**	50.62	52.82	48.71
MDAGESQ	0.33**	0.35**	2647.31	2900.39	2452.40
HOSPAFL	-0.03*	-0.18*	1.00	0.97	0.97
GS	-0.46***	-0.98*	0.42	0.12	0.32
IM	0.09**	-0.31	0.15	0.25	0.14
OB	-0.17***	-0.77*	0.23	0.08	0.16
PED	-0.01***	-0.01*	0.01	0.09	0.05
	$\lambda=0.55$[b]	$\lambda=0.91$[b]			
	$R_c=0.67$	$R_c=0.31$			

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[a] Of 130 HILMPs, 15% had to be dropped from the equation due to missing values. As a result, means for HILMPs may be different than those presented earlier.

[b] Associated Chi-square statistic significant at 1 percent level.

*F-ratio significant at 10 percent level.
**F-ratio significant at 5 percent level.
***F-ratio significant at 1 percent level.

employ more aides, suggesting some substitution of auxiliary personnel for physician time. Surprisingly enough, HILMPs actually use fewer ancillary services (with the exception of laboratory tests) than other LMP physicians once specialty is held constant, confirming the tremendous variation in ancillary utilization across specialties. Credentials and characteristics of HILMPs further distinguish them from their less affluent peers: HILMPs are more likely to be board-certified and have hospital affiliations than LOLMPs, and less likely to be FMGs. HILMPs are also notably more specialized.

As shown in the second discriminant function, HILMPs are indistinguishable from other high income physicians with respect to wages and visit lengths, but are different in a number of other ways. Large negative coefficients for general surgeons and OB-GYNs suggest that while small Medicaid practice physicians do not have to specialize in order to enjoy high incomes, physicians treating larger Medicaid caseloads do. HILMPs, while more specialized and more likely to have hospital affiliations than their HISMP colleagues, are actually less commonly board-certified, confirming descriptive findings. They also tend to be younger, which may explain their greater willingness to treat public patients (i.e., as they have had less time to build a strong private practice).

Once specialty differences between the two groups are held constant, we find HILMPs ordering significantly more laboratory tests and x-rays than HISMPs, yet performing less surgery. Of particular interest is the fact that HILMPs employ more aides than HISMPs, suggesting that these large Medicaid practice physicians must to some degree depend on auxiliary personnel, primarily clerical, to earn wages comparable to those of HISMPs.

6.9 Practice Costs, Revenues and Markups

Although HILMPs generate some portion of their extraordinary incomes through greater visit volume and more ancillary services, higher markups also turn out to be an important contributing factor. Table 6-9 compares gross revenues, costs and markups on a per visit basis in HILMPs, SNMPs and HISMPs. Averaged across all physicians, markups in HILMPs are significantly greater than in SNMPs: $14.50 vs. $10.67, or $3.87 more per visit. The primary source of the differential is gross revenues per visit, as costs in the two practice groupings are essentially the same ($6.76 and $6.57). It is certainly surprising that gross revenues per visit are higher in HILMPs since Medicaid fees, which constitute a relatively larger proportion of revenues in LMPs, generally average only about two-thirds of usual fees. Yet gross revenues per visit are almost 25 percent higher in HILMPs than in SNMPs, $21.26 compared to $17.20. Greater ancillary utilization in HILMPs undoubtedly plays some role in raising gross revenues but cannot possibly account for the entire difference.

Perhaps differences in specialty mix between the two groups are the answer. Yet, according to Table 6-9, this apparently is not the case; specialty-specific findings do not notably depart from the aggregate results noted above. Markups are systematically higher in HILMPs, with particularly large differences found in internal medicine and obstetrics-gynecology (although only for the latter was the difference statistically significant). Again, the major source of higher markups in HILMPs is higher gross revenues per visit, although slightly lower costs are also a factor in several instances (general practice, general surgery and internal medicine). Differences in gross revenues between HILMPs and SNMPs are most pronounced for OB-GYNs, amounting to $4.62 per visit.*

Findings for general practitioners are contrary to those for other primary care physicians. HILMP GPs actually have lower gross revenues per visit than their SNMP peers, as originally hypothesized. Costs were also lower in HILMPs though, by about 22 percent. Thus, while the net result was higher markups in HILMPs, the difference between the two groups was fairly small ($8.68 vs. $8.27 for SNMPs), suggesting that volume, ancillary use, or some other factor must be contributing to the marked difference in HILMP incomes for GPs.

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*While a statistically significant difference in gross revenues per visit was also found in pediatrics, a small sample size for pediatricians reduces the meaningfulness of these findings.

TABLE 6-9

VISIT COSTS, PEVENUES AND MARKUPS BY SPECIALTY: SNMPs[a], HISMPs and HILMPs

Specialty	Gross Revenues Per Visit	Cost Per Visit	Net Revenue Per Visit (Mark-up)
General Practitioner			
SNMP	$14.17	$5.89	$ 8.27
HISMP	16.56	5.98	10.58
HILMP	13.28	4.59	8.68
General Surgeon			
SNMP	20.76	7.18	13.58
HISMP	21.72	6.89	14.83
HILMP	22.14	7.04	15.09
Internist			
SNMP	19.03	7.03	12.00
HISMP	23.90	7.02	16.88
HILMP	22.36	6.17*	16.19
OB-GYN			
SNMP	21.85	8.16	13.70
HISMP	23.41	7.22	16.18
HILMP	26.47	8.91	17.56*
Pediatrician			
SNMP	13.41	5.15	8.26
HISMP	12.16	4.21	7.95
HILMP	16.99*	6.82*	10.17
All Physicians			
SNMP	17.20	6.57	10.67
HISMP	20.14	6.53	13.61
HILMP	21.26***	6.76	14.50***

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[a] SNMP refers to SMPs and nonparticipants combined.

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

It is also interesting to compare costs, revenues and markups in HILMPs with other, high income practices. Theoretically, gross revenues per visit and markups should be higher and average costs lower in high income small Medicaid practices for several reasons. First, HISMPs devote a larger portion of their practice to better paying private (or even Medicare) patients, presumably explaining, at least in part, their ability to earn such high incomes (i.e., they are less subject to the influence of low Medicaid fees). Second, HISMPs are better trained and qualified than HILMPs, and can command higher fees for their services, raising average revenues per visit. Third, if private patients have a less serious casemix than Medicaid recipients as has been suggested, this should tend to lower costs. Furthermore, physicians who are less dependent on the Medicaid market are expected to be treating a more affluent, better insured private population at the margin, a group less likely to default on bills, thereby raising collection costs.

Counter-theoretical evidence is shown in Table 6-9, however, with HISMPs actually having lower gross and net revenues per visit than HILMPs. Averaged across all physicians, gross revenues per visit were $1.12 less for HISMPs, and markups, $0.89 less. While these differences are fairly small, they are clearly the opposite of what we might have expected. Costs are slightly lower in HISMPs, as hypothesized.

It is possible that specialty differences between the two groups are the cause of these unexpected findings. HISMPs do have more GPs than HILMPs (33% vs. 18%) and slightly fewer general surgeons and OB-GYNs, which could suggest lower average revenues. Looking at the specialties individually, we find that gross revenues and markups are not always higher in HILMPs. In general practice and internal medicine, for example, the reverse is true. Costs are somewhat higher for HISMPs in these specialties as well. Yet how are HILMP general surgeons, OB-GYNs and pediatricians able to generate higher reveneus than their high income peers, *ceteris paribus*? The difference is particularly striking in obstetrics-gynecology;* HILMPs gross $3.06 more per visit than their HISMP colleagues, keeping $1.38 of the difference after costs.

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*While differences are also large in pediatrics, we are again constrained by small sample sizes.

There are several conceivable explanations for these findings. Visit mix differences between HILMPs and HISMPs might provide a clue. If HILMPs were performing relatively more operations and/or treating more emergency room (ER) patients (which are reimbursed at a higher rate than an average inpatient visit), their average revenues could be higher. But judging from visit mix data presented earlier in Table 6-4, visit composition varies very little between the two high income groups. Even within obstetrics-gynecology, where the greatest differences were noted, visit mix (not shown by specialty) does not appear to be the answer: 6 percent of HILMP caseloads are devoted to operations (10.4 per week) compared to 5 percent for HISMPs (9.2 operations per week). Similar findings obtain with respect to ER visits (averaging 2% and 1% of HILMP and HISMP caseloads, respectively). A second possible explanation is ancillary services. With the exception of office surgery, HILMPs do order more ancillaries than HISMPs, even after adjusting the two groups for specialty differences.* Although adding ancillary charges to visit revenues will raise gross revenues per visit by a relatively greater amount in HILMPs, it is doubtful that ancillaries alone can explain higher average revenues in HILMPs.

Another explanation for these anomalous findings may be physician fees. If HILMPs charged higher fees for their services, they could conceivably generate higher gross revenues. Table 6-10 presents usual and Medicaid fees for a routine office and hospital visit by specialty and practice grouping. While all Medicaid fees are systematically higher in HILMPs, this is not necessarily true of usual fees, particularly for hospital visits. In obstetrics-gynecology, where disparities in gross revenues per visit were greatest, HILMPs' usual fees were consistently lower, refuting the hypothesis that private fees are a primary source of the difference. Hence, the ability of HILMPs to enjoy higher gross revenues per visit than their HISMP colleagues remains a mystery.

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*To compare ancillary utilization directly, HILMP ancillary rates were weighted by the relative specialty mix of HISMPs. The HILMP-adjusted measures were: lab tests, 41%; office surgery, 5.4%; x-rays, 19.2%; and injections, 24.2%. It should be noted that this is a different specialty adjustment than the one presented in the tables, using the specialty mix of HISMPs rather than SNMPs.

TABLE 6-10

USUAL AND MEDICAID FEES[a] FOR ROUTINE HOSPITAL AND OFFICE VISITS BY INCOME AND MEDICAID PRACTICE SIZE

Hospital Visit Fees	SMPs and Nonparticipants	HISMP	LOLMP	HILMP
General Practitioner				
Usual	$16.38	$16.98	$14.28	$15.47
Medicaid	8.80	9.14	10.16	8.19
General Surgeon				
Usual	19.04	19.64	21.32	16.85
Medicaid	8.73	8.29	12.16	11.09
Internist				
Usual	20.32	19.36	17.90	19.05
Medicaid	9.68	9.27	8.57	11.85
OB/GYN				
Usual	19.01	17.52	17.05	15.70
Medicaid	8.70	9.71	9.74	9.47
Pediatrician				
Usual	17.44	17.43	17.26	11.10
Medicaid	9.50	12.28	10.69	9.35
All Physicians				
Usual	18.01	18.18	16.44	16.34
Medicaid	9.08	9.22	9.93	9.87

TABLE 6-10 cont.

USUAL AND MEDICAID FEES[a] FOR ROUTINE HOSPITAL AND OFFICE VISITS BY INCOME AND MEDICAID PRACTICE SIZE

Office Visit Fees	SMPs and Nonparticipants	HISMP	LOLMP	HILMP
General Practitioner				
Usual	12.75	14.36	12.95	13.15
Medicaid	8.30	9.20	8.93	8.38
General Surgeon				
Usual	15.31	15.66	16.74	17.22
Medicaid	8.43	9.01	10.81	10.24
Internist				
Usual	17.28	17.29	15.72	19.19
Medicaid	9.83	10.29	8.76	11.46
OB/GYN				
Usual	18.50	16.84	16.96	15.56
Medicaid	9.99	11.00	10.60	10.62
Pediatrician				
Usual	13.26	12.57	13.09	12.63
Medicaid	8.75	8.61	10.18	9.67
All Physicians				
Usual	14.82	15.45	14.36	16.33
Medicaid	8.88	9.54	9.38	10.25

[a] In $1977, adjusted for geographic cost-of-living differences.

TABLE 6-11

USUAL AND MEDICAID FEES[a] FOR SPECIALTY-SPECIFIC PROCEDURES BY INCOME AND MEDICAID PRACTICE SIZE

Specialty-Specific Procedure	SMPs and Nonparticipants	HISMP	LOLMP	HILMP
Cholecystectomy (GS)[b]				
Usual	$684.40	$703.74	$705.80	$729.82
Medicaid	312.27	326.73	394.91	373.11
Hernia Repair (GS)				
Usual	420.94	444.40	483.79	464.20
Medicaid	204.30	200.76	253.99	201.83
Electrocardiogram (IM)				
Usual	24.51	24.22	25.58	26.34
Medicaid	14.21	13.22	16.85	17.38
Proctoscope Exam (IM)				
Usual	28.41	30.53	30.28	26.10
Medicaid	15.91	18.53	18.74	14.65
Diagnostic D & C (OB)				
Usual	213.50	204.57	215.49	213.17
Medicaid	83.59	88.73	106.32	108.87
Delivery (OB)				
Usual	543.08	534.12	538.96	538.37
Medicaid	237.50	264.70	289.68	252.47
Spinal Puncture (PED)				
Usual	22.14	25.25	20.31	14.00
Medicaid	11.44	14.95	10.82	7.09

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[a] In $1977, adjusted for geographic cost-of-living differences.

[b] Fee data was requested on two specific procedures frequently performed by these specialists, although other physicians may perform them as well. They were chosen to facilitate within-specialty comparisons, and were asked only of one specialty group.

According to Tables 6-10 and 6-11 (the latter of which presents Medicaid and usual fees for selected procedures), at least part of the answer is that Medicaid fees are notably higher in HILMPs, both absolutely and as a proportion of usual fees. Hence, marginal revenues do not have to fall as low before HILMP physicians begin accepting Medicaid patients, which in turn raises average revenue per visit. Consistent with findings for secondary specialists, Medicaid fees average 60 percent of HILMPs' usual fees for a hospital visit, compared to only 50 percent for SNMPs. There is a similar difference in office fees, although of a smaller magnitude (63% in HILMPs vs. 60% in SNMPs). Differences between the two groups in Medicaid reimbursements for specialty-specific procedures can be noted as well, ranging from 44 percent to 66 percent of HILMPs' usual fees, yet only 39 percent to 58 percent of SNMPs' charges.

In sum, low Medicaid fees pose less of an obstacle to earning high incomes for these physicians than originally would have been predicted. Nevertheless, higher Medicaid fees for HILMPs are clearly not the primary source of their excessive incomes, to the extent they fall below usual charges. Heavier caseloads and more ancillary services appear to be much more important factors.

6.10 Practice Location, Size and Organization

Medicaid mills are characterized in the literature as urban phenomena, primarily found in the inner-city ghettos of the industrial Northeast. They have also been stereotyped as multi-physician practices, generally incorporated. Are HILMPs different from their peers with respect to practice location and organization as these characterizations would suggest?

6.10.1 Location

HILMPs are not geographically distributed like most other physicians, as evidenced in Table 6-12. Over fifty percent of all HILMPs are found in the South, with another quarter located in the Western portion of the country. This stands in marked contrast to SNMPs, less than half of whom are found in these two regions combined. One possible explanation for the disproportionate number of southern HILMPs is the use of UCR reimbursement methods by many Southern Medicaid programs, which are relatively

TABLE 6-12

GEOGRAPHIC LOCATION: HILMPS VS. OTHER PRACTICES

	SMPs and Nonparticipants	HISMP	LOLMP	HILMP
Location				
Large Metropolitan	40.0%	33.4%	42.8%	20.9%
Small Metropolitan	38.4	34.7	35.1	50.6
Non-Metropolitan	21.6	32.0	22.1	28.4
Region				
North East	28.4	14.0	25.9	7.7
North Central	23.4	21.7	15.6	13.8
South	30.6	44.7	21.6	52.1
West	17.6	19.5	36.9	26.4

TABLE 6-13

PRACTICE SIZE AND ORGANIZATION BY INCOME CLASS

	SMPs and Nonparticipants	HISMP	LOLMP	HILMP
Size				
Solo	65.3%	47.4%	79.8%	66.8%
2-5 MDs	31.2	46.8	18.3	30.0
6 + MDs	3.5	5.8	1.9	3.2
Total	100%	100%	100%	100%
Incorporation	41.5	61.1	32.6	40.7
Prepaid	3.6	1.8	2.1	3.6

more generous to physicians. (HISMPs are more similar to HILMPs in this respect; 45% of HISMPs reside in the South, and 20% in the West.) Contrary to popular opinion, conspicuously few HILMPs are found in the North East, merely eight percent, compared to more than three times that many SNMPs. Nor are HILMPs disproportionately found in the nation's largest cities; instead they are predominantly located in smaller urban areas (51%) and rural settings (28%). SNMPs, by contrast, are twice as likely as HILMPs to be found in large metropolitan areas (40% vs. 21%), as are low income large Medicaid practices. The majority of HILMPs, therefore, are not the Medicaid mills of the urban North East described in the Moss investigations, but are typically Southern and Western physicians, mostly specialists, filling the gap left by physicians choosing not to participate in the program (30% of Southern physicians are nonparticipants), and/or reaping the benefits of more generous Medicaid policies and a larger eligible population.

6.10.2 Practice Size and Organization

HILMPs are an interesting group not because they stand out from other physicians with respect to practice size and organization, but because they cannot be distinguished from their SNMP peers (see Table 6-13). Approximately 67 percent of HILMPs are in solo practice (compared to 65% of SNMPs), with another 30 percent in practices of between two and five physicians. HISMP physicians, on the other hand, are much more likely than HILMPs to be in small, group practices, and are less commonly solo. HISMPs are also most likely to be in large group practices than any of the other practice groupings (6% of HISMPs are in practices with six or more physicians vs. 3.5%, 3% and 2% of SNMPs, HILMPs and LOLMPs, respectively).

Finally, only about 41 percent of HILMPs and SNMPs are incorporated, compared to 61 percent of HISMPs. Lower income LMPs are least likely to be incorporated of all (33%). These findings suggest that the two high income groups differ quite notably in practice size and organization: HISMPs are generally incorporated, larger practices, while HILMPs are typically solo and unincorporated. The size and organization of HISMPs would in itself imply a more lucrative practice -- more numerous referrals

and consultations, cost sharing, economies of scale, etc. Thus, in size and organization anyway, HILMPs are more like SNMPs than HISMPs, in marked contrast to all other comparisons. The most obvious conclusion is that neither size nor organization alone can explain the extraordinary incomes of HILMPs.

6.11 Why Are HILMP Incomes So High? A Summary

HILMP physicians earn over 67 percent more than the average SNMP physician. We are now in a position to explain in general terms how this comes about, although many of the details are still obscure.

Physician incomes can be considered as the product of markups per visit times total visits of all types. Relative HILMP/SNMP incomes, RNI_{HS}, can be decomposed as the product of markup (MU) and volume (V) ratios:

$$(6.1) \qquad RNI_{HS} = \frac{HILMP}{SNMP} = \frac{MU_H}{MU_S} \cdot \frac{V_H}{V_S}$$

$$= \frac{\$14.50}{\$10.67} \cdot \frac{210}{171} = 1.36 \cdot 1.23 = 1.67.$$

HILMP visit volume per week (and presumably per year) is 23 percent more than average SNMP volume while markups over nonphysician costs are a full 36 percent more. Thus, volume explains somewhat less than half of the difference, markups somewhat more, although the relative contribution of each cannot be uniquely dissociated given the multiplicative relationship.

HILMP physicians earn a good deal of their extra income by seeing more patients, even though they do not work longer hours as we have seen. A somewhat larger portion of their higher incomes, however, cannot be simply attributed to greater productivity, but rather, to higher "profits" per visit. This is unexpected given the much lower Medicaid fees they are receiving on a large percentage of their caseload (as compared with SNMPs). How is this possible?

Markups can be decomposed into Medicaid and non-Medicaid visit-plus-ancillary revenues minus average visit costs. Based on rough calculations, revenues per visit in HILMPs should be 14 percent less on average because of lower Medicaid fees. Yet we have already shown that they are roughly 25 percent more ($21 vs. $17). As it turns out, the 14 percent fee reduction is almost exactly offset by the more expensive volume mix of HILMPs (e.g., 2.5% of HILMP contacts are relatively expensive operations vs. 1.8% for SNMPs), leaving the 25 percent observed discrepancy in markups to be explained by ancillaries and costs. As average costs do not differ between the two groups, the residual is explained by either (a) greater ancillary intensity in HILMPs, (b) higher ancillary fees, or (c) both.

When compared with other HISMPs, HILMPs are very similar. Incomes, volume, and average markups are all identical, but HILMP markups should, in fact, be lower due to lower Medicaid fees and heavier participation. There is no demonstrable difference between the two high income groups in volume mix or average costs, either, implying that higher HILMP ancillary use (and/or fees) is exactly offsetting the Medicaid fee effect. This is consistent with the findings reported in Table 6-5 showing HILMPs prescribing more lab tests, x-rays, and injections than HISMPs. Thus, HILMPs, in order to match the high incomes of physicians less dependent on Medicaid, generate more ancillaries to offset lower fees for Medicaid visits. How much of this is a necessary result of casemix differences and how much is purely a financial consideration remains a question for future work.

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7.0 PHYSICIAN PARTICIPATION IN FIXED FEE MARKETS

Chapter 7 includes three distinct, but related analyses of physician participation in fixed fee markets. Although the analyses all derive from Chapter 2's theory, each is based on a different sample of physicians and addresses a somewhat different research question. In Section 7.1, we examine the Medicaid participation decision for specialist (non-primary care) physicians. (For comparable econometric analysis of primary care physicians, the reader is referred to Sloan, Mitchell, Cromwell, 1978.) Nine different medical and surgical specialties, ranging from allergy to urology, are included. Section 7.2 analyzes the Medicaid participation decision for a tenth specialty: psychiatry. We separated psychiatrists from other specialists because of their unique practice patterns and because many Medicaid programs place special limits on mental health services. Finally, in Section 7.3, we analyze the physician's joint decision to participate in Medicaid *and* to take Medicare patients on assignment. Here we focus on the five primary care specialties. (Medicare assignment data were not available for the other specialties.)

Despite the different samples and somewhat different empirical specifications, the results from all three analyses are highly consistent; they all emphasize the importance of policy variables in the physician's participation decision. Higher public program fees definitely induce nonparticipants into the Medicaid-assignment market and encourage participating physicians to expand their public caseloads. State Medicaid programs that streamline the billing and collection process reap the rewards in terms of higher participation levels. The use of a fiscal agent for Medicaid claims processing, for example, reduces payment delays, and raises participation rates. States that impose limits or prior authorization requirements for Medicaid physicians' services find that fewer physicians are willing to participate. More liberal eligibility criteria also encourage participation, by expanding the potential pool of Medicaid and Medicare assigned beneficiaries. This is particularly true when Medicaid benefits are extended to the "medically indigent." These and other findings are discussed in depth below.

7.1 Medicaid Participation by Medical and Surgical Specialists

To date only descriptive statistics have been available on specialists' participation in state Medicaid programs. (See Mitchell and Cromwell, 1980 and Chapter 5 of this report.) No behavioral analyses have been conducted to examine the factors influencing the participation decision for these physicians, similar to those conducted for primary care physicians (Sloan, Mitchell, Cromwell, 1978). The regressions presented below provide the first national estimates of the impact of policy variables on specialists' willingness to treat Medicaid patients. The sample includes the nine medical and surgical specialties described earlier in Chapter 5.0., with an unweighted sample size of 2,137.

7.1.1 Empirical Specification

Based on the economic theory presented in Chapter 2.0, a reduced form equation for Medicaid participation was specified, including fee schedules, Medicaid program characteristics, and exogenous demand and supply variables. Variable definitions and means are presented in Table 7-1. All monetary variables were adjusted for geographic cost-of-living differences and expressed in 1978 dollars.

Dependent Variables: The dependent variable is the percentage of Medicaid patients in the physician's practice (PCTMCD). For policy purposes, it is useful to further dichotomize the physician's participation decision: (1) whether or not a physician participates (PART, a dichotomous yes/no variable); and (2) the percentage of Medicaid patients only for participating physicians. The model was tested with all three specifications.

Independent Variables - Fee Schedules: Two variables were included to measure the influence of relative fee schedules: the Medicaid fee for a follow-up office visit (MCDF) and Blue Shield's maximum allowed payment for the same procedure (BSF). The Medicaid fee is defined for the physician's state and the Blue Shield fee for the physician's Blue Shield plan area; both were constructed from self-reported survey data. As these responses may reflect an area's specialty mix, individual physician responses were weighted by national proportions of physicians in medical and surgical specialties. Medicaid participation rates are hypothesized to be positively related with the Medicaid fee, and negatively with the Blue Shield payment.

TABLE 7-1

MEDICAID PARTICIPATION REGRESSIONS - VARIABLE MEANS AND DEFINITIONS FOR MEDICAL AND SURGICAL SPECIALISTS

Variable	Definition	Mean
PCTMCD	% of practice devoted to Medicaid patients	11.17
PART	Whether physician participates in Medicaid (0= does not participate; 1= does participate)	0.81
MCDF	Medicaid fee for a follow-up office visit	10.18
BSF	Blue Shield fee for a follow-up office visit	14.84
CLAIMSP	State Medicaid program has fiscal agent for claims processing	0.47
LIMITS	limits and/or prior authorization requirements on physician services	0.22
MEDINDIG	state Medicaid program has a medically indigent option	0.65
AFDC/SSI	proportion of county population on AFDC or SSI	0.08
Y	per capita income (in 000's)	6.20
ALL	physician is an allergist	0.03
CARD	physician is a cardiologist	0.11
DERM	physician is a dermatologist	0.09
GI	physician is a gastroenterologist	0.03
OPHTHAL	physician is an ophthalmologist	0.24
ORTHO	physician is an orthopedic surgeon	0.21
ENT	physician is an otolaryngologist	0.10
URO	physician is a urologist	0.12
BOARD	physician is board-certified	0.75
TWFMG	Third World foreign medical graduate	0.02
MDAGE	physician's age	48.67
MDAGESQ	physician's age squared	2497.89
FEMALE	physician is female	0.04
WAGE	wage rate for non-physician personnel	4.91
MDPOP	physicians per thousand population	1.62

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[a] Means correspond to the sample used in eqs. (7.1) and (7.2), Table 7-2.

Medicaid Program Characteristics: Medicaid program characteristics include both collection cost and eligibility variables. Two variables were specified to capture the relative difficulty of obtaining reimbursement under different state Medicaid programs. CLAIMSP is a dummy variable set equal to one, if the physician is located in a state where a fiscal agent is responsible for Medicaid claims-processing. Almost one-half of physicians (47%) practice in such states. Where the state has contracted with a fiscal agent, it is hypothesized that claims are processed more quickly, thereby reducing payment delays and encouraging Medicaid participation.

Although state Medicaid programs are mandated to provide physician services, they may impose limitations on the quantity of services, or they may require that physicians receive prior authorization before supplying certain types of services to patients. Both quantity limits and prior authorization directly restrict the supply of physician visits under Medicaid. Prior authorization may further discourage Medicaid participation, because of the administrative "red-tape" involved. LIMITS is set equal to one if the state Medicaid program has either quantity limits or prior authorization requirements for physician services. Almost one-quarter of sample physicians (22%) are subject to such restrictions.

State Medicaid programs also vary in the criteria they use to determine Medicaid eligibility. Where the relative pool of Medicaid recipients is larger, the demand for Medicaid services will also be higher, encouraging physician participation. No data on total Medicaid enrollments are available below the state level, but we do have county figures for the number of persons who are categorically eligible for Medicaid. AFDC/SSI is defined as the proportion of county population who are recipients under the AFDC or SSI programs. If the state has elected to cover the "medically needy" in its Medicaid program as well(the medically indigent option), MEDINDIG is specified as a dummy variable equal to one, and zero otherwise. About two-thirds of sample physicians (65%) live in states with this extended coverage.

Private Demand: Higher incomes are hypothesized to shift the physician's fee-setting demand curve outwards, thus lowering participation rates. Income (Y) is defined as per capita income in the physician's county.

Physician Credentials: Three variables measuring the physician' credentials will influence his willingness to accept Medicaid: specialty, board-certification, and FMG status. Specialists face a higher demand for their services in the fee-setting market and thus will be less likely to participate in Medicaid compared with general practitioners. Of course, our sample is

composed solely of specialists. Is demand higher for some specialties than for others? Specialties requiring longer residency periods embody greater amounts of professional training and hence may command higher fees than others. Within our group of nine specialties, neurosurgeons and urologists spend the longest time in training, 5 years versus 4 years for the remaining specialists. We know from descriptive findings presented earlier, however, that surgical specialists are generally more likely to accept Medicaid, probably for several reasons. For one, Medicaid fee schedules may be relatively more generous in their reimbursement of surgical procedures. (Our Medicaid fee variable is based on an office visit and thus will not capture inter-specialty differences in allowed fees.) In addition, surgical specialists are more likely to practice in public settings, such as hospitals, where it may be more difficult to refuse a Medicaid case, especially emergencies. Specialty effects will need to be tested empirically. We specify eight specialty dummy variables; neurosurgeons constitute the omitted category.

Board-certified physicians and graduates of U.S. and Western European medical schools are generally considered to be of higher technical quality and hence face a greater private demand for their services. As a result, they are hypothesized to accept fewer Medicaid patients. BOARD and TWFMG each assume the value one if the physician is board-certified or if he is a graduate of a Third-World medical school.

Practice Costs: Practice costs include the cost of the physician's time and the wage rate for nonphysician personnel. Women physicians (FEMALE) have been shown to work fewer hours (Kehrer, 1976), and thus may be less likely to participate in Medicaid, cutting back on low net marginal revenue patients first. Alternatively, women physicians may face lower private demand (due to discrimination) and thus be more likely to enter the Medicaid market.

More experienced physicians may be less willing to accept Medicaid patients, because of their higher implicit wage. As physicians age, however, demand for their services may fall in the private market. In this instance, participation rates will be higher. Because we expect the relationship to be U-shaped, physician age will be specified both in linear and squared form. If the wage effect dominates through late middle age with the demand effect becoming more important in later years, we would expect the MDAGE and MDAGESQ variables to be positive and negative, respectively.

When wage levels are high, it is less likely that the low Medicaid fee schedules will cover increased practice costs and physicians will be less willing to participate. WAGE is defined as a county index of hourly wage rates of nonphysician personnel. (Wage data for five categories of office staff were available from the HCFA-NORC survey.)

Physician-Population Ratio: MDPOP is defined as the number of office-based physicians per 1,000 county population. As this ratio rises, competition among physicians for private patients increases and private demand shifts in, encouraging Medicaid participation. MDPOP is thus hypothesized to be positively related to participation rates. A negative (or zero) coefficient, on the other hand, could be interpreted as evidence that physicians can protect their workloads by inducing demand for non-Medicaid services.

7.1.2 Estimation Methods

In our specialist sample, 19 percent of physicians did not treat any Medicaid patients. In these instances, the dependent variable (percent of patients receiving Medicaid) is zero. Estimated parameters using ordinary least square (OLS) will be biased towards zero, however, when the dependent variable is continuous and there is a concentration of values at a lower limit (Goldberger, 1964). In order to overcome this problem, "Tobit" analysis was used. Using Tobit, one estimates an index that simultaneously determines both the probability of observing a nonzero value for the dependent variable and the dependent variable's expected value conditional on a set of exogenous variables. Similarly, with a qualitative, zero-one, dependent variable (1 = physician participates in Medicaid, 0 = does not participate), OLS methods are inefficient because of the concentration of values at two extremes. Multivariate probit analysis is preferred here because it constrains the predicted values of the dependent variable to the unit (0,1) interval (Goldberger, 1964).

Interpretation of Tobit and probit results, however, is a two-step process, unlike OLS estimates which have direct implications (e.g., the coefficient of income in a consumption function is the marginal propensity to consume). Estimates must first be converted using the cumulative normal distribution before impacts on conditional probabilities can be determined. Signs of coefficients and statistical significance do give direction of effects on probabilities, however.

Finally, the PCTMCD equation (percent of patients Medicaid) was estimated for those physicians with positive responses only, i.e., Medicaid participants. Here, OLS is an appropriate and efficient estimation technique.

7.1.3 Econometric Findings

Three regression equations are displayed in Table 7-2. Equation (7.1) presents probit estimates of the physician's dichotomous participation decision, while eq. (7.2) explains the percent of practice devoted to Medicaid patients using Tobit analysis. Equation (7.3) presents OLS regression results for Medicaid participants only. The majority of coefficients are statistically significant in the hypothesized direction. A number of parameter estimates, however, change in magnitude or sign between the probit equation, on the one hand, and the Tobit and OLS equations, on the other, suggesting behavioral differences in (a) the decision to participate in Medicaid, and (b) the percent of Medicaid patients accepted, conditional on (a). Generally, the differences are most marked between eqs. (7.1) and (7.3), with eq. (7.2) capturing the net impact (where there are differences). These results are also very similar to those obtained in our earlier study of primary care physicians (Sloan, Mitchell, Cromwell, 1978).

Because the probit and Tobit coefficients are not directly interpretable, a table of marginal impacts of the statistically significant variables is provided (Table 7-3). Elasticities are calculated for continuous variables, and marginal effects for dummy variables. For the reader's convenience, we also include the appropriate elasticities for the OLS results.

The impact of an increase in the Medicaid fee is positive, as predicted, and highly significant in all three equations. Specialists are definitely willing to treat Medicaid patients, when program fees are higher. The estimated elasticities associated with the MCDF variable range from 0.21 to 0.31, suggesting that the magnitude of physician response to changes in the reimbursement level would be fairly modest, however.* A ten percent increase in the Medicaid fee would raise the probability of participation by only 2.1 percent, and Medicaid participation rates by 3.1 percent (around a mean rate of 11.2%).

Medicaid does compete with other third-party payors for physician time; higher Blue Shield fees significantly reduce the probability the physician will enter the Medicaid market (eq. 7.1). The BSF variable was

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*These elasticities are modest only in comparison with those obtained for primary care physicians, where they were on the order of 0.19, 0.71, and 0.95 (Sloan, Mitchell, Cromwell, 1978).

TABLE 7-2

MEDICAID PARTICIPATION REGRESSIONS - RESULTS FOR MEDICAL AND SURGICAL SPECIALISTS

	Dependent Variable		
	PART	PCTMCD	PCTMCD
Independent Variable	Probit (7.1)	Tobit (7.2)	OLS (participants only) (7.3)
MCDF	0.08***	0.69***	0.31**
BSF	-0.06***	-0.15	0.14
CLAIMSP	0.30***	2.92***	1.46**
LIMITS	-0.30***	-1.12	-0.06
MEDINDIG	0.29***	5.85***	4.86***
AFDC/SSI	-3.46***	-3.72	13.76**
Y	-0.18***	-2.15***	-1.51***
ALL	-0.12	0.67	-2.22
CARD	-0.49***	-4.08**	-1.62
DERM	-0.45**	0.72	2.96*
GI	-0.04	-2.21	-2.26
OPHTHAL	-0.21	2.50	3.32**
ORTHO	-0.14	0.10	0.28
ENT	-0.05	4.60***	4.58***
URO	0.24	3.29**	2.22
BOARD	0.20**	-1.24*	-2.78***
TWFMG	-0.12	5.05**	4.60**
MDAGE	-0.09**	-0.52**	-0.69***
MDAGESQ	0.0006*	0.003	0.006***
FEMALE	-0.25	0.10	4.18**
WAGE	0.13*	0.84	-0.12
MDPOP	0.06**	-0.02	-0.04
CONSTANT	4.26***	26.34***	32.00***
		σ = 14.40	$R^2(\sigma)$ = .10 F(22,1726)=9.72***

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

TABLE 7-3

IMPACT OF SELECTED EXPLANATORY VARIABLES ON MEDICAID PARTICIPATION - MEDICAL AND SURGICAL SPECIALISTS

	Elasticity			Marginal Effect		
Variable	Probit	Tobit	OLS	Probit	Tobit	OLS
MCDF	0.21	0.31	0.23	--	--	--
BSF	-0.25	a	a	--	--	--
CLAIMSP	--	--	--	7.0	2.7	1.5
LIMITS	--	--	--	-7.8	a	a
MEDINDIG	--	--	--	7.1	5.3	4.9
AFDC/SSI	-0.07	a	0.07	--	--	--
Y	-0.32	-0.58	-0.66	--	--	--
CARD	--	--	--	-13.8	-3.7	a
DERM	--	--	--	-12.4	a	3.0
OPHTHAL	--	--	--	a	a	3.3
ENT	--	--	--	a	4.30	4.6
URO	--	--	--	a	3.1	a
BOARD	--	--	--	5.0	-2.6	-2.8
TWFMG	--	--	--	a	4.8	4.6
MDAGE	-0.89	-0.76	-1.29	--	--	--
FEMALE	--	--	--	a	a	4.2
MDPOP	0.02	a	a	--	--	--

[a] Variable was not significant.

not significant in the other two equations, however suggesting that only physicians near the "drop-out" kink are affected.

Quicker and more efficient claims processing definitely encourages Medicaid participation. States with a fiscal agent (CLAIMSP) enjoy Medicaid participation rates almost 3 percentage points higher than states who process their claims themselves. Our results show that these higher participation levels reflect both the attraction of new physicians to the Medicaid market (eq. 7.1), and the expansion of Medicaid caseloads by physicians already participating (eq. 7.3).

States that impose limits or prior authorization requirements for Medicaid physician services average fewer participants in their Medicaid program compared with other states. The marginal effect for the LIMITS variable in eq. (7.1) implies that such restrictions reduce the probability of participation by 7.8 percentage points. Surprisingly, once physicians have decided to participate, these limits have no effect on how many Medicaid patients they choose to see; participating physicians may be indifferent to, or have simply learned to accept, the collection difficulties associated with Medicaid.

It had been hypothesized that physician participation would be greater where the pool of Medicaid recipients was relatively larger. Where Medicaid eligibility is extended to the medically needy, participation levels are indeed higher; the MEDINDIG variable is significant in all three equations. States who have adopted the medically indigent option enjoy participation rates over 5 percentage points higher than in other states. The effect is greatest above the threshhold, i.e., for physicians who have already chosen to participate in the Medicaid program, as predicted by theory.

The relative size of the categorically eligible Medicaid pool (AFDC/SSI) has a somewhat unexpected effect. In counties where these recipients are a larger proportion of the population, the probability of physician participation is significantly lower (eq. 7.1), contrary to theory. Physicians already participating, on the other hand, do devote more of their practice to Medicaid patients as expected (eq. 7.3). In both instances, the elasticity associated with the AFDC/SSI variable is quite small: 0.07. The theory in chapter 2.0 suggests one possible

explanation for these inconsistent signs. In poor, high Medicaid neighborhoods where physicians are relatively scarce, both the number of nonparticipants and large Medicaid practices may be higher, as increased private demand leaves a small number of physicians available to treat a relatively large Medicaid population. Rather than an increase in average physician participation rates, we thus observe an increase in the maldistribution of Medicaid patients across practices. Although we have held physician supply constant here, our MDPOP variable is defined at the county level and may not capture distributional inequalities in MDPOP within the county, say in inner city areas.

Higher incomes raise private demand, thus significantly depressing participation rates as expected. A ten percent increase in per capita income (Y) lowers Medicaid participation 5.8 percent. Medicaid patients in these high-income areas may experience particular difficulty finding a physician who will treat them.

Even holding credentials, and demand and supply factors constant, the surgical specialties are generally more willing to treat Medicaid patients than are the medical specialties. Compared with neurosurgeons (the omitted specialty), cardiologists and dermatologists are significantly less likely to participate. The estimated marginal effects are substantial; being one of these two medical specialties reduces the probability of participation by 12-14 percentage points. Two of the surgical specialties, on the other hand, have significantly higher levels of Medicaid participation: otolaryngologists and urologists. Among those specialists already in the Medicaid market, dermatologists and ophthalmologists spend a greater percentage of their practice with Medicaid patients.

Board-certified physicians have significantly lower levels of Medicaid participation as seen in eqs. (7.2) and (7.3), but actually have a higher probability of entering the Medicaid program compared with non-board-certified physicians (see eq. 7.1). This apparent anomaly is easily resolved. Any reported Medicaid output, no matter how small, qualified a physician as a Medicaid participant in our analysis. Physicians may occasionally treat Medicaid patients on an emergency basis, or for charitable reasons, but otherwise do not participate in the Medicaid program. Board-certified specialists more frequently practice in public (e.g. clinic or hospital) settings where it would be difficult to refuse an emergency case.

As expected, Third World FMGs treat significantly more Medicaid patients, almost 16 percent of their caseload compared with 11 percent for

U.S. and Western European graduates. Unlike similar analyses of primary care physicians, however, there is no pronounced impact for the TWFMG coefficient in the participants-only regression.

The MDAGE and MDAGESQ coefficients imply a declining participation rate associated with physician age (due to the higher implicit wage of more experienced physicians), but with the rate beginning to rise in later years (due to a drop in private demand for older physicians). As seen in Table 7-3, the net total impact is negative, with an estimated elasticity of -0.76 evaluated at the means for the Tobit equation. Two opposite impacts had been hypothesized for women physicians: a negative supply effect and a positive discrimination effect. The latter appears to dominate, as women physicians do appear to have higher participation rates, but the FEMALE coefficient is significant only in the participants-only equation.

It had been hypothesized that high wage levels for nonphysician personnel would raise practice costs, and thus discourage Medicaid participation. The WAGE variable, however, is positive (and significant, albeit only at the 10% level) in one of the three equations (eq. 7.1), and insignificant otherwise.

Higher physician-population ratios increase the probability of entering the Medicaid market as predicted, but have no impact on levels of participation. Although significant, the elasticity associated with the MDPOP coefficient is quite small: 0.02.

7.2 Medicaid Participation by Psychiatrists

7.2.1 Sample Description

As with other specialists, only descriptive information has been available to date on psychiatrists' participation in state Medicaid programs. (See Mitchell and Cromwell, 1981 and Chapter 5 of this report.) We present here for the first time econometric analysis of the factors influencing the psychiatrist's decision to treat Medicaid patients.

A small number of psychiatrists (2.7% of the total sample) were dropped from the regression analysis. As their exclusion was not random, but in fact colinear with state, some discussion is warranted. The District of Columbia's Medicaid program will reimburse outpatient mental health services only within a clinic setting; private, office-based psychiatrists in D.C. do not face the same Medicaid participation decision and had to be excluded. In ten additional states,* primarily located in the Great Plains and Mountain regions, none of the physicians surveyed reported Medicaid fee data; since it was not possible to replace missing values for this key variable, these psychiatrists had to be dropped from the regression analysis. Physicians not answering this question include a disproportionate number of nonparticipants, and some bias may have been introduced as a result. It is undoubtedly small, however; psychiatrists from these states represent only 2.9 percent of all psychiatrists nationwide (AMA, 1977). The total (unweighted) sample size used in the psychiatrist regressions was 893.

7.2.2 Empirical Specification and Estimation

The equation specification for psychiatrists' Medicaid participation was basically similar to that used for the other specialists in Section 7.1.1. with a few changes described below. (Variable definitions and means for psychiatrists are presented in Table 7-4.) The two fee variables (MCDF and BSF) were based on a 45-50 minute therapy session rather than a follow-up office visit. The physician-population ratio was redefined as the psychiatrist-population ratio; distributional data on psychiatrists were not available

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* Delaware, Idaho, Montana, Nebraska, Nevada, New Hampshire, South Carolina, South Dakota, Tennessee, and Wyoming.

TABLE 7-4

MEDICAID PARTICIPATION REGRESSIONS -- VARIABLE MEANS AND DEFINITIONS FOR PSYCHIATRISTS[a]

Variable	Definition	Mean
PCTMCD	percent of practice Medicaid	8.02
PART	whether or not the psychiatrist participates in Medicaid (1=yes, 0=no)	0.58
MCDF	Medicaid fee for 45-50 minute therapy session	28.15
BSF	Blue Shield fee for 45-50 minute therapy session	39.42
CLAIMSP	state Medicaid program has fiscal agent for claims processing	0.43
LIMITS	state Medicaid program has limits on prior authorization requirements for psychiatrist services	0.35
AFDC/SSI	proportion of county population eligible for AFDC or SSI	0.09
MEDINDIG	state Medicaid program has "medically indigent" option	0.73
Y	per capita income (in 000's)	6.44
BOARD	psychiatrist is board-certified	0.49
TWFMG	Third World foreign medical graduate	0.02
FEMALE	psychiatrist is a woman	0.09
MDAGE	psychiatrist's age	48.52
MDAGESQ	psychiatrist's age squared	2447.13
PSYPOP	psychiatrist-population ratio (per 100,000 state population)	10.74

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[a] Means correspond to the sample used in eqs. (7.4) and 7.5), Table 7-5.

at the county level and PSYPOP is expressed per 100,000 state population. Finally, the wage rate for non-physician personnel was dropped from the list of explanatory variables, as most psychiatrists do not employ any aides.

Three equations were estimated, similar to those estimated for the medical and surgical specialists: (1) Probit estimation of the zero-one participation decision (PART); (2) percent of practice Medicaid (PCTMCD) using Tobit analysis; and (3) PCTMCD for Medicaid participants only using ordinary least squares.

7.2.3 Econometric Findings

The three regression equations are displayed in Table 7-5. The results are generally comparable to those found for the medical-surgical specialists, especially for the policy variables. A table of marginal impacts for the statistically significant variables is also provided (Table 7-6).

The impact of an increase in the Medicaid fee is positive and highly significant in all three equations. Psychiatrists are much more willing to participate in Medicaid when reimbursement rates are higher. The estimated elasticities associated with the MCDF variables are somewhat higher than those for other specialists, ranging from 0.31 to 0.53. A ten percent increase in the Medicaid fee would raise participation rates by 5.3 percent (around a mean of 8%). Reimbursement levels of other third-party payors generally do not affect Medicaid participation. Unlike other physician services, private insurance coverage for mental health services is limited and subsequently the extent of inter-program competition for psychiatrist time may be limited. Inexplicably, however, the BSF variable is positive and significant in eq. (7.6), implying that participating psychiatrists are more likely to expand their Medicaid caseloads when Blue Shield fees are higher.

States who have delegated Medicaid claims processing to a fiscal agent definitely reap the rewards in terms of increased Medicaid participation. The marginal effects for the CLAIMSP variable imply that the use of a fiscal agent would almost double overall participation, an increase of 6.9 percentage points. Limits or prior authorization requirements for Medicaid services discourage participation, but only above the threshhold. Participating psychiatrists in these Medicaid programs average participation rates about two percentage points lower than those in states without such limits (around a mean of 13.7%).

TABLE 7-5

MEDICAID PARTICIPATION REGRESSIONS -- RESULTS FOR PSYCHIATRISTS

	Dependent Variable		
	PART	PCTMCD	PCTMCD
	Probit	Tobit	OLS (participants only)
Independent Variable	(7.4)	(7.5)	(7.6)
MCDF	0.02**	0.36**	0.20**
BSF	0.002	0.10	0.26**
CLAIMSP	0.35***	9.40***	6.87***
LIMITS	0.16	1.53	-2.16*
AFDC/SSI	-1.70**	-14.08	13.48
MEDINDIG	-0.01	5.33**	7.92***
Y	-0.15***	-1.81**	-0.0003
BOARD	0.09	-0.23	-1.54
TWFMG	0.06	2.22	1.22
FEMALE	-0.37**	-1.93	-2.20
MDAGE	0.07*	0.25	-0.96
MDAGESQ	-0.0006*	-0.002	0.01*
PSYPOP	0.02***	0.23**	-0.02
CONSTANT	-1.31	-18.50	12.13
		$\sigma=18.68$	
			$R^2(c)=0.13$
			F(13,535)=7.36***

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

TABLE 7-6

IMPACT OF SELECTED EXPLANATORY VARIABLES ON MEDICAID PARTICIPATION -- PSYCHIATRISTS

	Elasticity			Marginal Effect		
Variable	Probit	Tobit	OLS	Probit	Tobit	OLS
MCDF	0.32	0.53	0.41	--	--	--
BSF	a	a	0.75	--	--	--
CLAIMSP	--	--	--	13.7	6.9	6.9
LIMITS	--	--	--	a	a	-2.2
MEDINDIG	--	--	--	a	3.6	7.9
AFDC/SSI	-0.11	a	a	--	--	--
Y	-0.66	-0.60	a	--	--	--
MDAGE	1.21	a	-1.65	--	--	--
FEMALE	--	--	--	-14.7	a	a
PSYPOP	0.15	0.13	a	--	--	--

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[a] Variable not significant.

Psychiatrists are more willing to treat Medicaid patients in states which have extended coverage to the medically indigent, a finding consistent with that for the other specialists. These states average participation rates almost 4 percentage points higher than states without the medically needy option. Again, we have the unexpected finding that a relatively larger pool of AFDC and SSI recipients discourages participation (eq. 7.4).

Higher incomes definitely shift out private demand for psychiatric services, thus discouraging participation in the Medicaid program. A ten percent increase in per capita income (Y) lowers Medicaid participation by 6 percent.

Surprisingly, the psychiatrist's credentials have no impact on the participation decision, once other demand and supply variables are held constant. Both the BOARD and TWFMG variables are insignificant in all equations.

Psychiatrists with higher time prices generally appear to accept fewer Medicaid patients. Unlike other women specialists who tend to have higher participation rates, the supply effect dominates for female psychiatrists who are significantly less likely to enter the Medicaid market. The marginal effect for the FEMALE coefficient (eq. 7.4) implies that the probability of a woman psychiatrist seeing Medicaid patients is about 0.43, compared with 0.58 for male psychiatrists. The remaining time price variable, physician age, implies different effects depending on whether the psychiatrist is above or below the participation threshhold. The MDAGE and MDAGESQ coefficients in eq. 7.4 suggest an increasing probability of participation for younger physicians, in contrast with our findings for other specialists, but with the probability declining after age 58. For psychiatrists already in the Medicaid market, however, the signs are reversed (see eq. 7.6). Older psychiatrists have significantly higher Medicaid caseloads.

Finally, increased competition among psychiatrists definitely encourages Medicaid participation. The PSYPOP variable is positive and significant in both the probit and Tobit equations. The elasticities associated with the PSYPOP coefficient imply a larger impact for competition than that found for the other specialists. A ten percent increase in the psychiatrist - population ratio would raise Medicaid participation levels by 1.3 percent. (The comparable effect for medical and surgical specialists was 0.2%.)

7.3 Joint Medicare Assignment-Medicaid Participation

In Chapter 2, we argued that the physician's decision to participate in Medicaid and his decision to take Medicare patients on assignment are similar. In both instances, the physician agrees to accept the program's fixed fee as payment-in-full. In this section, we analyze the joint decision in detail, focussing in particular on the policy variables that influence physicians' willingness to participate in the fixed fee markets. The sample includes the five primary care specialties in the 1975 survey that were described in Chapter 4.2., with a total unweighted sample size of 1,840. The 1975 survey is the only one of the three that included information on Medicare assignment. Use of the 1975 survey also allows us to include explanatory variables not available on the other surveys, such as physician race, collection ratios, and political attitudes.

7.3.1 Empirical Specification and Estimation

Based on Chapter 2's theory, a reduced form equation for the joint participation decision was specified, similar to that specified in Sections 7.1 and 7.2 but with Medicare fees and program characteristics included as well. Variable definitions and means are presented in Table 7-7. All monetary variables were adjusted for geographic cost-of-living differences and expressed in 1976 dollars.

Dependent Variable: The dependent variable is the percentage of Medicare assigned and Medicaid patients in the physician's practice (PCTM-M). By summing the two, we can be certain that we have captured both mandatory and voluntary assignment, a distinction made by Paringer (1980). Mandatory assignment refers to the joint Medicare-Medicaid beneficiaries for whom the physician must take assignment or forego any public reimbursement. For non-Medicaid-eligible elderly, the physician has complete discretion in his decision, hence the term voluntary assignment.

TABLE 7-7

VARIABLE MEANS AND DEFINITIONS: JOINT MEDICARE-MEDICAID PARTICIPATION

Variable	Definition	Mean
PCTM-M	percent of practice devoted to Medicare assigned and Medicaid patients	20.75
MPC	Medicare prevailing charge for a follow-up office visit	10.22
MCDF	Medicaid fee for follow-up office visit	8.00
BSF	Blue Shield fee for follow-up office visit	8.70
CRR	Medicare carrier rate of reduction	0.73
DENY	proportion of all assigned claims that are denied	0.06
INVEST	proportion of all assigned claims that are investigated	0.07
OVER65	proportion of county population aged 65 or over	0.10
CLAIMSP	state Medicaid program has fiscal agent for claims processing	0.57
LIMITS	state Medicaid program has limits or prior authorization requirements for physician services	0.23
AFDC/SSI	proportion of county population eligible for AFDC or SSI	0.08
MEDINDIG	state Medicaid program has "medically indigent" option	0.70
Y	per capita income (in 000's)	5.33
PTCOLL	physician is able to collect more than 95% of patient billings	0.20

TABLE 7-7 cont.

VARIABLE MEANS AND DEFINITIONS: JOINT MEDICARE-MEDICAID PARTICIPATION

Variable	Definition	Mean
GS	physician is general surgeon	0.17
OB	physician is OB-GYN	0.14
IM	physician is internist	0.23
PED	physician is pediatrician	0.12
BOARD	physician is board-certified	0.43
TWFMG	Third World foreign medical graduate	0.07
FAC	physician is medical school faculty member	0.11
MDAGE	physician's age	52.42
MDAGESQ	physician's age squared	2859.64
FEMALE	physician is female	0.05
BLACK	physician is black	0.02
PRACY	physician has nonpractice income of $10,000+	0.14
RESTRICT	physician has restricted his practice for health reasons	0.12
WAGE	wage rate for nonphysician personnel	3.75
MDPOP	physician-population ratio	1.21
LIB	physician strongly agrees that medical care is a right	0.19[a]
CON	physician strongly disagrees that medical care is a right	0.29[a]

[a] Responses based on national sample only.

Independent Variables -- Fee Schedules: Three variables were included to measure the influence of relative fee schedules: the Medicare prevailing charge for a follow-up office visit (MPC), the Medicaid fee (MCDF), and Blue Shield's allowed payment (BSF) for the same procedures. The Medicare prevailing charge is defined for the physician's reasonable charge locality and was obtained from the 1976 Medicare Directory of Prevailing Charges.* The Medicaid fee is defined for the physician's state, and the Blue Shield fee for the physician's Blue Shield plan area; both were constructed from self-reported survey data. As their responses may reflect an area's specialty mix, individual physician responses were weighted by national proportions of physicians in each of the five specialties. Joint participation rates are hypothesized to be positively related with the Medicaid and Medicare fees, and negatively with the Blue Shield payment.

Some physicians are reimbursed at less than the prevailing charge (if their customary charge, as determined by Medicare, is lower), and in these instances MPC will not capture the relative generosity of Medicare carriers. In order to capture this, we also included the carrier rate of reduction (CRR), i.e. the percent of times the Medicare payment is less than the physician's charge. This variable, although defined for a fairly large area (carrier-wide), does provide a partial measure of the physician's net fee. The mean for CRR implies that Medicare payments are lower than the physician's billed fee 73 percent of the time. The higher the carrier rate of reduction, the lower the assignment rate (and hence the joint participation rate) is hypothesized to be.

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*As seen in Table 7-7, the Medicare prevailing charge is larger than the Blue Shield fee, rather than smaller as expected. In part, this may be because they were obtained from different sources. In addition, the prevailing charge is the maximum allowed charge and thus may exceed the average allowed charge under Medicare.

Medicare and Medicaid Program Characteristics: Program characteristics include both collection cost and eligibility variables. Measures of the administrative burden under Medicare include investigation (INVEST) and denial (DENY) rates for assigned claims. These rates were available by Part B carrier for 1976. Although these rates are low on average (6-7%), they could have a strong impact on physicians with large Medicare caseloads. Physicians are hypothesized to be more willing to accept assignment when these costs are lower, ceteris paribus. Medicare eligibility is defined as the proportion of persons aged 65 and over in the physician's county (OVER65), and raises demand for both assigned and nonassigned services. Previous work has shown that the net effect is negative (Mitchell and Cromwell, 1981).

Two variables were also specified to capture the relative difficulty of obtaining reimbursement under different state Medicaid programs. CLAIMSP is a dummy variable set equal to one, if the physician is located in a state where a fiscal agent is responsible for Medicaid claims-processing. Where the state has contracted with a fiscal agent, it is hypothesized that claims are processed more quickly, thereby reducing payment delays and encouraging Medicaid participation. Over one-half of sample physicians (57%) live in states with such an arrangement. LIMITS is set equal to one if the state Medicaid program has either quantity limits or prior authorization requirements for physician services. These restrictions are hypothesized to discourage Medicaid participation. Almost one-quarter of sample physicians (23%) are subject to these limitations.

Where the relative pool of Medicaid recipients is larger, the demand for Medicaid services will also be higher, encouraging physician participation in both public programs. AFDC/SSI is defined as the proportion of county population who are recipients under the AFDC or SSI programs. When the OVER65 and AFDC/SSI means are summed, we see that almost one out of every five county residents (18%) is eligible for public health insurance. If the state has elected to cover the "medically needy" in its Medicaid program as well (the medically indigent option), MEDINDIG is specified as a dummy variable equal to one, and zero otherwise. The majority of physicians (70%) are located in states with this option.

Private Demand: Higher incomes are hypothesized to shift the physician's fee-setting demand curve outwards, thus lowering participation rates. Income (Y) is defined as per capita income in the physician's county.

In poorer communities, the physician may experience difficulties or delays in collecting from patients. This has the effect of shifting (and rotating) the physician's demand and marginal revenue curves inwards, thereby reducing his net fee. Where collection ratios are lower, physicians are hypothesized to be more willing to take Medicaid and Medicare assigned patients. Each physician was asked what percentage of patient billings he collected during the preceding year: 96-100%, 90-95%, 80-89%, or less than 80%. PTCOLL is specified as a dummy variable set equal to one if the physician was able to collect more than 95 percent of billings, and zero otherwise.

Physician Credentials: Four variables measuring the physician's credentials will influence his willingness to accept Medicare assignment or Medicaid: specialty, board-certification, FMG status, and whether he is a faculty member of a medical school. Specialists face a higher demand for their services in the fee-setting market and thus will be less likely to participate in fixed fee programs compared with general practitioners. Offsetting this demand effect is a collection effect, i.e. the apparent willingness of physicians with large bills to take assignment in order to guarantee payment. For this reason, general surgeons and OB-GYNs may have higher joint participation levels. Because of their low (or zero) Medicare demand, OB-GYNs and pediatricians may have lower participation rates. The dummy variables GS, IM, OB, and PED represent general surgeons, internists, OB-GYNs, and pediatricians, respectively. General practitioners constitute the omitted category.

Board-certified physicians, U.S. and Western European medical school graduates, and medical school faculty are generally considered to be of higher technical quality, and hence face a greater private demand

for their services. As a result, they are hypothesized to take fewer Medicaid and assigned Medicare claims. (Offsetting this demand effect for medical school faculty, however, is their greater likelihood of practicing part-time in hospital OPDs. Because assignment is mandatory in these instances, faculty may have higher assignment rates.) BOARD, TWFMG, and FAC all assume the value one if the physician is board-certified, if he is a Third World FMG, or if he is a member of a medical school faculty.

Other Physician Demand Variables: Due to perceived professional inferiority, or discrimination, some physicians may face lower private demand and thus be more likely to enter the fixed fee markets. In Chapter 4.3, we saw that black and women physicians were disproportionately represented in large Medicare-Medicaid practices. Women physicians, on the other hand, have been shown to work fewer hours and thus may restrict their low net marginal revenue caseload (i.e. Medicaid and assigned Medicare patients). Including sex and race characteristics in our analysis will enable us to test whether these physicians do treat more public program patients, once attitudes, credentials, and other demand and supply variables are held constant. BLACK and FEMALE are both set equal to one if the physician is black or if the physician is a woman.

Practice Costs: Practice costs include the cost of the physician's time and the wage rate for nonphysician personnel. More experienced physicians may be less willing to accept fixed fee patients, because of their higher implicit wage. As physicians age, however, demand for their services may fall in the private market. In this instance, participation rates will be higher. Because we expect the relationship to be U-shaped, physician age will be specified both in linear and squared form. If the wage effect dominates through late middle age with the demand effect becoming more important in later years, we would expect the MDAGE and MDAGESQ variables to be positive and negative, respectively.

Physicians with nonpractice income over $10,000 (PRACY), and physicians who report that health problems have restricted their practice (RESTRICT) are hypothesized to value their leisure time more highly, and thus devote less of their caseload to fixed fee, public patients.

When wage levels are high, physicians will be less willing to accept low net marginal revenue patients. WAGE is defined as a county index of hourly wage rates of nonphysician personnel.

Physician-Population Ratio: MDPOP is defined as the number of office-based physicians per 1,000 county population. As this ratio rises, competition among physicians for private patients increases and private demand shifts in, encouraging entry into the public markets. MDPOP is thus hypothesized to be positively related to participation rates. A negative (or zero) coefficient, on the other hand, could be interpreted as evidence that physicians can protect their workloads by inducing demand for private services.

Political Attitudes: In order to examine noneconomic factors that may influence the joint participation decision, we include two variables measuring physician political attitudes. The first variable (LIB) is a dummy variable set equal to one if the physician strongly agrees with the statement that "it is the responsibility of society, through its government, to provide everyone with the best available medical care, whether he can afford it or not." The second variable (CON) is set equal to one if the physician strongly disagrees with the same statement. The inclusion of these two variables will also enable us to test the impact of economic policy variables over and above that of idiosyncratic attitudes.

Estimation Method: Examination of the dependent variable showed no substantial concentrations of values at either limit. Only nine percent of physicians did not accept either Medicare assignment or Medicaid (in which case the dependent variable is zero), and only one percent reported that all of their patients were in one of these two programs. In this instance, ordinary least squares will yield unbiased, efficient estimates and is an appropriate technique. Two equations were estimated: one based on both the national and regional samples (appropriately weighted) and one based on the national sample only but with the political attitude variables added. (The attitudinal questions were not included in the regional sample.)

7.3.2 Econometric Findings

Two regression equations are presented in Table 7-8. Equation (7.7) presents estimates of the physician's joint decision based on the pooled samples, while equation (7.8) is a similar specification with the two attitudinal variables added (LIB and CON) based on the national sample alone. The majority of coefficients are statistically significant in the hypothesized direction. These results are very similar to those obtained in our earlier studies of Medicaid participation and Medicare assignment (Mitchell and Cromwell, 1981; Sloan, Mitchell, Cromwell, 1978).

Higher public program fees definitely encourage physician participation as predicted. Physicians appear to be more sensitive to increases in the Medicare (MPC) charge than in the Medicaid (MCDF) fee, even though the two programs make up equal portions of their caseloads on average. The coefficient associated with the MPC variable is positive and highly significant, while the MDCF variable is significant only at the 25 percent level (t=1.1). The estimated elasticities suggest that the magnitude of physician response to changes in reimbursement levels would be fairly modest, however. A ten percent increase in either the Medicare prevailing charge or the Medicaid fee would raise joint participation levels almost four percent, or less than one percentage point (around a mean of 21%).

A second measure of Medicare generosity, the carrier rate of reduction (CRR), had no impact on participation levels although previous work had shown a strong negative effect on assignment. The Medicare and Medicaid programs do compete with other third-party payors for physician time; higher Blue Shield fees significantly depress participation rates. The BSF elasticity is comparable in absolute size to those for the two public program fee variables: -0.38.

Medicare and Medicaid program characteristics have the expected impacts on the joint participation decision. Higher investigation and denial rates for assigned Medicare claims exert a negative impact on participation rates, although only the DENY coefficient is significant. Greater Medicare coverage (OVER65) raises demand for both assigned and nonassigned services, but the net effect is clearly negative. As hypothesized, the physician is able to draw upon a larger pool of nonassigned patients before entering the assignment market.

TABLE 7-8

REGRESSION RESULTS FOR THE JOINT MEDICARE-MEDICAID PARTICIPATION DECISION

Independent Variables	Dependent Variable: PCTM-M Nat/Reg Samples (7.7)	 Nat Sample Only (7.8)
MPC	0.75**	0.99**
MCDF	1.00	0.89
BSF	-0.91***	-0.96*
CRR	1.16	15.81
DENY	-44.42*	-50.08
INVEST	-28.43	-35.76
OVER65	-64.18**	-65.05*
CLAIMSP	8.11***	8.55***
LIMITS	-1.81	-3.12
AFDC/SSI	45.90***	53.49*
MEDINDIG	7.23***	6.64***
Y	-0.34	-0.21
PTCOLL	-7.07***	-6.60***
GS	2.26	2.48
OB	-9.24***	-9.46***
IM	-4.44***	-4.39**
PED	-11.02***	-10.49***
BOARD	-0.43	-0.50
TWFMG	10.02***	8.52***
FAC	1.13	0.59
FEMALE	1.28	0.10
BLACK	17.77***	21.83***
MDAGE	-1.35***	-1.32**
MDAGESQ	0.01***	0.01**
PRACY	-3.56**	-3.43*
RESTRICT	-2.92*	-2.50
WAGE	-5.83***	-4.88**
MDPOP	-1.71*	-2.87
LIB	--	2.60*
CON	--	-3.59**
CONSTANT	76.54***	60.80***
	$R^2(c)= 0.15$ $F(28,1811)=12.24$***	$R^2(c)=0.16$ $F(30,903)=6.90$***

***Significant at one percent level.
**Significant at five percent level.
*Significant at ten percent level.

The use of a fiscal agent to process Medicaid claims encourages physician participation by reducing payment delays. The marginal effect for the CLAIMSP coefficient implies that state Medicaid programs with such an arrangement enjoy participation rates about 8 percentage points higher than states who process their own claims. Restrictions on physician services under Medicaid have a negative effect on joint participation levels as predicted, although the LIMITS coefficient does not quite attain statistical significance (t=1.3).

Finally, physicians definitely are more likely to participate in public programs when the pool of Medicaid beneficiaries is larger. Areas with a categorically eligible Medicaid population one standard deviation above the mean (AFDC/SSI=0.12) experience participation rates about 3.5 percentage points higher than in areas where the Medicaid population is one S.D. below the mean (0.04). Both increased assignment and increased Medicaid participation contribute to these higher levels. (In the case of SSI recipients who are jointly eligible for both Medicare and Medicaid, the physician must accept assignment.) Joint participation rates are also significantly higher in those states that have extended Medicaid coverage to the "medically indigent" (MEDINDIG). These states enjoy participation levels 7.23 percentage points higher than states which provide coverage only to the categorically eligible.

Higher area incomes (Y) had no direct, statistical impact on participation, their effect instead coming indirectly through the physician's ability to collect from patients (PTCOLL). Physicians are significantly more likely to participate if they are unable to collect at least 95 percent of their billings. In this instance, where collection ratios are low, they prefer the direct payment offered by the Medicaid and Medicare assignment programs.

Four variables were included to measure physician credentials: specialty (GS,IM,OB, and PED), BOARD, TWFMG, and FAC. Internists, OB-GYNs, and pediatricians accept significantly fewer public program patients as predicted, due to higher private demand for their services and to the small Medicare caseloads of the two latter specialties. For general surgeons, the desire to ensure collection of large bills appears to dominate this specialty demand effect; they are more likely (albeit not significantly so) to treat Medicare assigned and Medicaid patients.

Third World FMGs devote a significantly larger proportion of their total caseload to public patients, about 50 percent more than the average U.S. or Western European medical school graduate. Once specialty was held constant, the remaining credential variables (BOARD, FAC) were not significant.

Earlier in Chapter 4.3, we saw that physicians with large Medicaid-Medicare practices were more likely to be "minority" physicians, i.e. blacks and women. These minority physicians may be found in the public market in disproportionate numbers because of low private demand for their services. The sources for this low demand may be either legitimate (fewer qualifications) or illegitimate (discrimination by patients or referring physicians). Once specialty, credentials and other variables are held constant, however, women physicians (FEMALE) are not any more likely than their male counterparts to participate in public programs. Black physicians, on the other hand, are still significantly more likely to treat Medicaid and Medicare-assigned patients, even after adjusting for these other factors. The BLACK coefficient implies that the black physician on average has a public program caseload almost twice the size that of white physicians, about 39 percent Medicaid-Medicare assigned versus 21 percent. Of course black physicians are more apt to treat black patients who in turn are more likely to be Medicaid or assigned beneficiaries, but this apparently is not by choice. Black physicians consistently report they would prefer to treat a more racially mixed patient population (Gray, 1978). We explore the characteristics, earnings, and practice patterns of black physicians in detail in Chapter 9.

Physicians with higher time prices definitely appear to take fewer public program patients. The MDAGE and MDAGESQ coefficients imply a declining participation rate associated with physician age (due to the higher implicit wage of more experienced physicians), but with the rate beginning to rise after age 67 (due to a drop in private demand for elderly physicians). The net total impact is negative, with an estimated elasticity of -2.03 evaluated at the means. The PRACY and RESTRICT coefficients are also consistently negative as hypothesized and significant. Physician participation in fixed fee public programs appears to be highly sensitive to other practice costs as well.

A ten percent increase in wage levels for nonphysician personnel would lower participation rates by 10.5 percent.

Higher physician-population ratios lower participation rates, although the MDPOP coefficient is significant only in eq. (7.7). As increased competition for private patients was hypothesized to encourage public program participation, the negative (and zero) coefficients could be interpreted as evidence that physicians are able to protect their private workloads through inducement. Alternatively, the underlying relationship may be more complex. We know from other work, for example, that high MDPOP areas are characterized not by higher levels of Medicaid participation, but by fewer participants and by the concentration of large numbers of Medicaid patients within a few physician practices -- the so-called "Medicaid mills". (See Sloan, Mitchell, Cromwell, 1978; and Mitchell and Cromwell, 1979.) Competition thus appears to result in an increase in the maldistribution of Medicaid patients across practices, rather than an increase in average physician participation rates. A similar behavioral relationship between MDPOP and joint participation may also exist.

Finally, physician political attitudes do play an important role, as shown by the significant LIB and CON coefficients in eq. (7.8). Physicians who strongly disagree that medical care is a right devote only 17 percent of their total caseload to Medicaid-Medicare assigned patients on average, compared with over 23 percent for their more liberal colleagues (who strongly agree with the same statement).

8.0 IMPACT OF AN "ALL OR NOTHING" ASSIGNMENT REQUIREMENT UNDER MEDICARE

8.1 Introduction

Unlike Medicaid which requires that the physician accept the Medicaid fee as payment-in-full and forego collection from the patient, the Medicare program offers the physician two billing options. First, he can bill the Medicare patient at his usual fee, just as he would any other patient. The patient is then responsible for obtaining the reimbursement from the Medicare carrier. The patient must pay the deductible (if not previously satisfied), the 20 percent coinsurance on the Medicare prevailing charge, plus 100 percent of the physician's fee above the prevailing charge. Second, the physician may choose to have the patient's bill "assigned" to him. Under the "assignment of benefits" option, the physician accepts the Medicare prevailing charge as payment-in-full and is paid directly by the carrier. (The physician must still bill the patient, however, to collect the 20 percent coinsurance and any outstanding deductible.)

The Medicare program allows the physician to decide whether or not to accept assignment on a case-by-case basis. Over one-half of primary care physicians (52.9%) exercise this option (Mitchell and Cromwell, 1981); the remainder either accept all of their patients on assignment (18.9%) or none of them (28.2%). The willingness of the physician to take assignment has clear implications for financial liability of Medicare beneficiaries; for nonassigned claims, the patient is responsible for the difference between the physician's actual charge and the Medicare allowed charge. Beneficiary data show an average out-of-pocket payment for physicians' services of $79 in 1975, exclusive of premium contributions (Ferry et al., 1980); liability from unassigned claims accounted for 25 percent. For the very ill, total liability may be considerable.

The steady decline in Medicare assignment rates over the past ten years, from 60 percent of all claims to 50 percent, means that the elderly are bearing an increasingly larger share of their total medical care bill. Senior citizens, who read in their Part B handbook that Medicare will pay 80 percent of physicians' bills, are stunned to discover that Medicare actually reimburses closer to 50 percent. This apparent contradiction in benefits is one of the major complaints about Medicare made by the elderly. (See, for example. Select Committee

on Aging report, U.S. House of Representatives, 1980).

In an effort to raise assignment rates, policymakers have begun to consider introducing an "all-or-nothing" assignment requirement to the Medicare program. Such a requirement could assume two different forms. In the first instance (assumption 1) the physician would have to accept assignment or forego any government reimbursement for his services. Patients would not be able to receive payment directly from the government. Medicaid currently operates under such an "all-or-nothing" participation requirement, as do most national health insurance plans. Under an alternative (and less rigorous) "all-or-nothing" requirement, the case-by-case option would be dropped (assumption 2). Physicians must decide to accept all of their Medicare patients on assignment, or none of them. Patients, however, would retain the ability to collect the allowed Medicare charge from the government (minus the coinsurance).

The basic difference in the two assumptions comes in the ability-to-pay of nonassigned patients. Under assumption 1 their ability is constrained to their own out-of-pocket demand while under the second assumption nonassigned demand remains buoyed up by continued government payment, albeit indirect. Faced with either of these scenarios, the physician must make a dichotomous decision having potentially severe implications. This he/she must do under uncertainty, both in terms of Medicare private demand of currently assigned patients and ability to collect from such patients.

Both versions of an "all or nothing" requirement have been considered by policymakers.* The Medicaid option (assumption 1) has actually been introduced in Congress, but lawmakers have feared that such a measure would result in widespread defection by physicians from the Medicare program. A 1977 Medical Economics survey found that 31 percent of physicians reported they would drop out of the Medicare program if assignment was made mandatory, and 29 percent stated they would reduce their Medicare caseloads (Rosenberg, 1977).** Given the current dependence of many

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*Other means for increasing assignment include tax incentives, use of more recent charge data for reasonable charge determination, and simplified billing procedures for assigned patients. The latter approach, proposed by Senator Talmadge, includes an added financial incentive of a dollar per assigned claim.

**These percentages are based only on physicians who are currently treating Medicare patients, and thus differ somewhat from those reported in Medical Economics.

physicians on Medicare patients, these estimates are probably biased upwards. Internists, for example, devote 29 percent of their office practice to elderly patients on average (NCHS, 1978a); only those with strong private demand could probably afford to give up the Medicare subsidy.

The less drastic, and presumably more politically feasible, non-case option (assumption 2) has been discussed in congressional hearings, notably by Nelson Cruikshank, president of the National Council of Senior Citizens. Our theoretical and empirical analysis of the "all or nothing" requirement will be based on this non-case option.*

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*Mr. Cruikshank has expressed the fear that this option could lead to a two-tiered form of medicine, similar to what now exists under the Medicaid program. We examine this empirically in Section 8.4.

8.2 Theoretical Analysis of the All or Nothing Choice

8.2.1 The Decision Rule

In deciding whether to accept all Medicare patients on assignment, the physician must weigh the relative incomes under the "all or "nothing" choices. Since eliminating the case-by-case assignment option restricts the physician's ability to price discriminate, either of these two choices will result in some net revenue loss. We illustrate this algebraically, as follows:

$$(8.1)\quad TR_{m+n} = \left[R \cdot V_m \cdot AR + P_n \cdot V_n \ (1-AR)\right] \cdot (m+n)$$

where TR_{m+n} = total Medicare revenues;

R = Medicare allowed fee;

V_m, V_n = visits per assigned, nonassigned patient;

AR = assignment rate;

P_n = average physician nonassigned fee;

m,n = number of assigned, nonassigned patients.

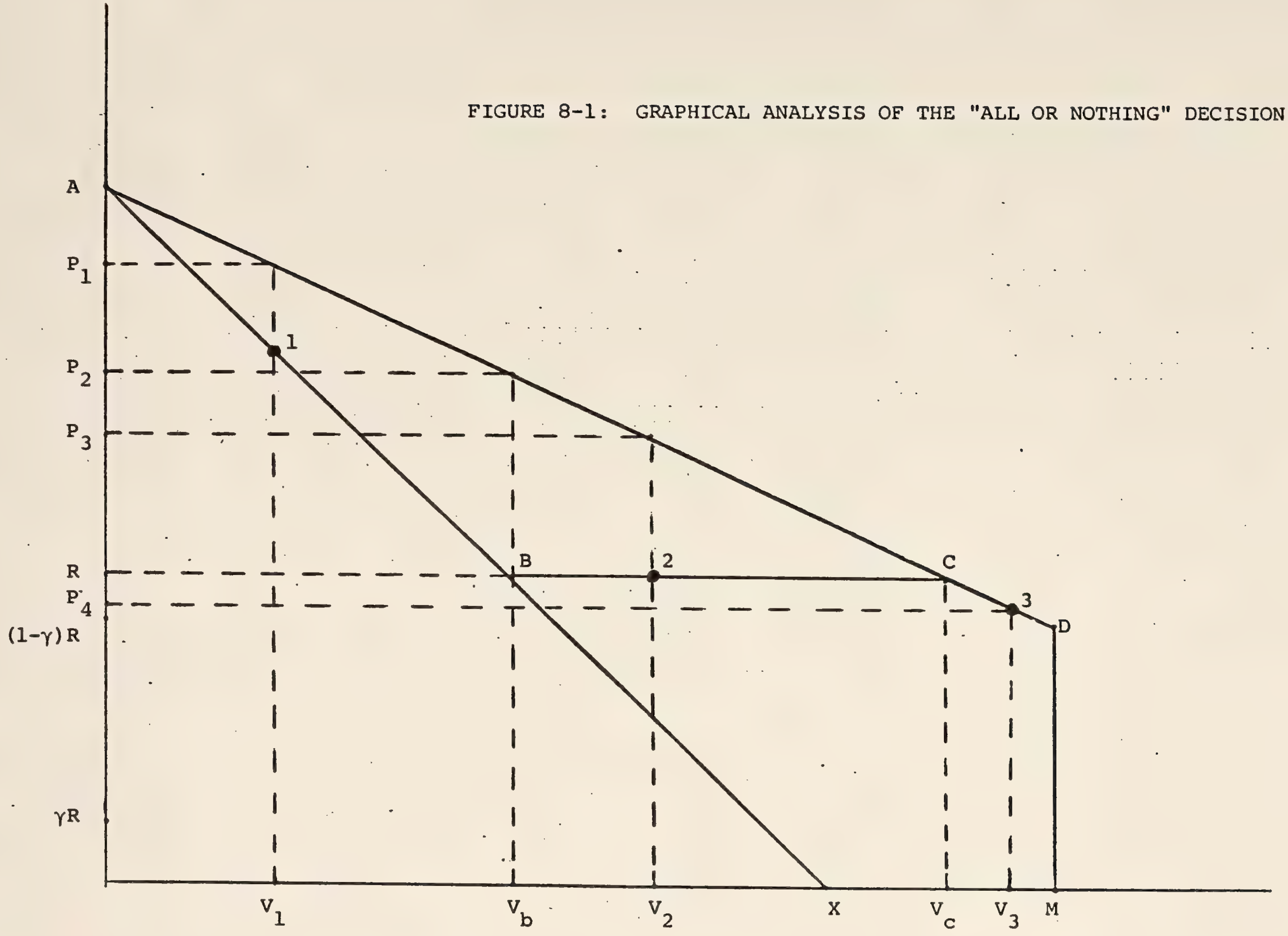
The physician's decision rule is to maximize TR_{m+n} for AR = 0 or 1, or more accurately (since the physician is assumed to be already maximizing total revenues at his current assignment rate), to minimize net losses (NL), as follows:

$$(8.2a)\quad NL(AR=1) \gtreqless NL(AR=0).$$

When expected losses under the "all" option exceed those under the "none" option, the physician will choose to take no patients on assignment. Where losses under the "none" option are higher, on the other hand, the physician will take all patients on assignment, ceteris paribus.

Let us examine the decision graphically in Figure 8-1. For the majority of physicians who currently accept assignment on a case-by-case basis, either choice will entail some amount of loss. Consider physician 2 who provides V_b nonassigned visits at price P_2 and V_2-V_b assigned visits. Under the "all" option, he must forego revenues equal to the rectangle $(P_2-R) \cdot V_b$. If, on the other hand, the physician chooses the "none" option, he will face a downward sloping marginal revenue curve (AX) for all his Medicare patients and must lower his fee to P_3. (For now, we make the critical assumption of no price discrimination.) This results in a loss of revenue

FIGURE 8-1: GRAPHICAL ANALYSIS OF THE "ALL OR NOTHING" DECISION RULE



from nonassigned patients who had been willing to pay P_2, equal to $(P_3-P_2)\cdot V_b$. Offsetting this loss, however, is a gain in revenue from previously assigned patients who are willing to pay more than the allowed Medicare charge, equal to $(P_3-R)\cdot(V_2-V_b)$. Substituting these expressions in for (2a), we have:

$$(8.2b)\quad (P_2-R)\cdot V_b \gtreqless (P_3-P_2)\cdot V_b - (P_3-R)\cdot(V_2-V_b).$$

Rearranging, we have:

$$(8.2c)\quad 0 \gtreqless (R-P_3)\cdot V_2$$

As P_3 should always be greater than R under less than 100% assignment, the right-hand term is clearly negative implying a smaller loss associated with the "none" option. This suggests that the physician at point 2 will always choose the "none" option.

Under what circumstances will a physician opt to take all patients on assignment? Equation (8.2c) implies that the physician will choose the "all" option only when P_3 falls below R and hence the right-hand term turns positive. (Where P_3 equals R, the physician will be indifferent, ceteris paribus). This makes sense when we compare total revenues for any physician accepting assignment along the horizontal portion of the marginal revenue curve, BC. Under the "all" option, total revenues will be $R\cdot V_2$, say, while under the "none" option they will always be greater, say, $P_3\cdot V_2$. For Medicare patients that were assigned along BC, the physician can always get at least \$R and usually more by not taking them on assignment while certainly being able to charge more than \$R for previously nonassigned patients. Only when the physician begins seeing Medicare patients too poor to pay even the coinsurance, γR, does he seriously consider the "all" option.

It thus becomes apparent that the physician's decision will depend on the price elasticity of demand and on the size of his assigned caseload. The more price inelastic the demand for care, the more the physician will have to lower his usual fee to maintain a given Medicare caseload under the "none" option. This has the effect of moving P_3 further away from P_2 and closer to R. Similarly, the larger his assigned caseload, the more he must lower his fee for all patients. In either case, the "all"

option will not be attractive except at those output levels where the physician must reduce his fee below R (after point C). At this point, patients are no longer willing to pay the full coinsurance. Physician 3, for example, would have to lower his usual fee to P_4, producing a net loss under the "none" option.

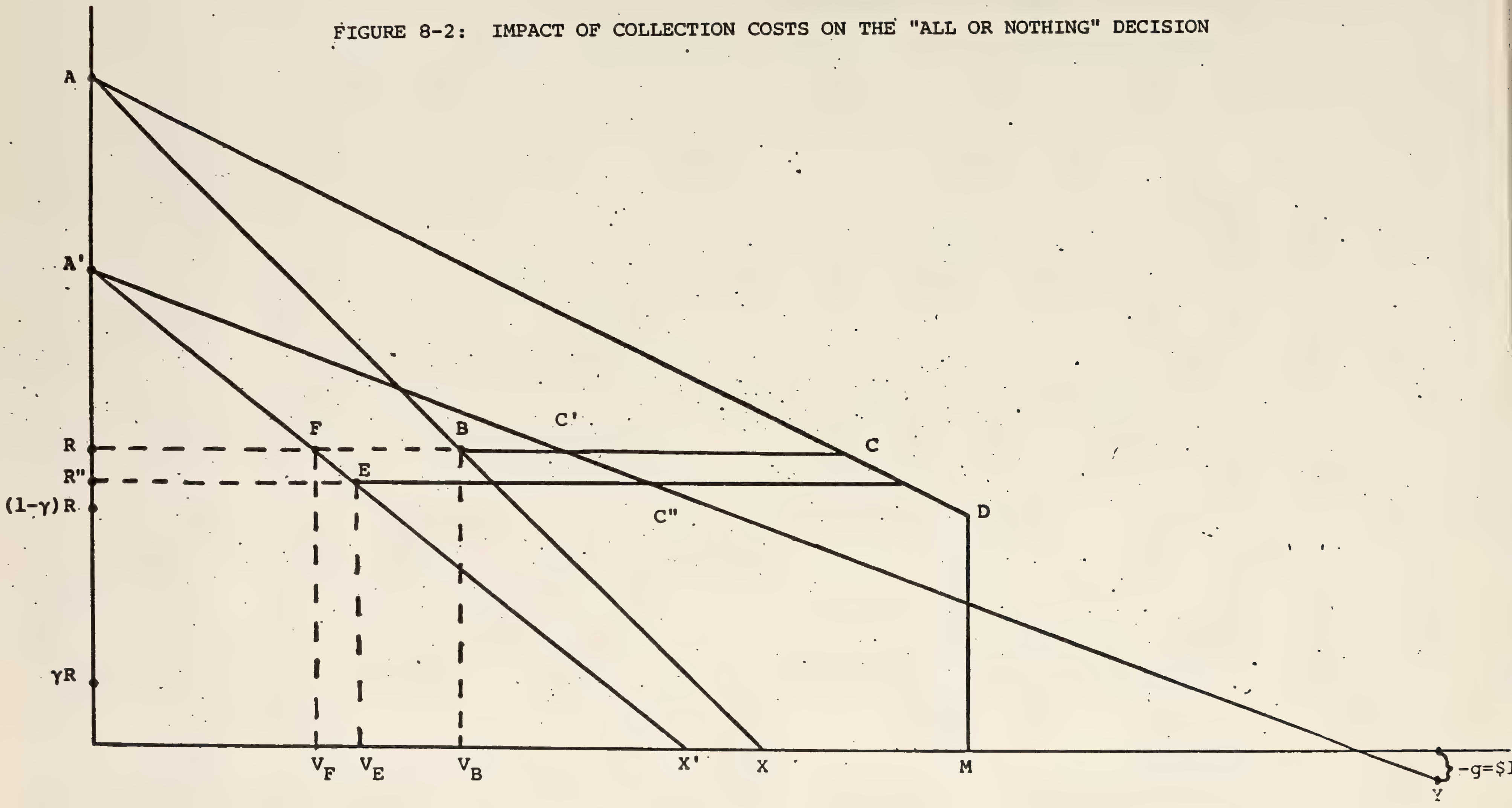
Some physicians do not currently exercise the case-by-case option under Medicare, and have effectively already chosen the "all" or "none" position that minimizes their losses. Consider, for example, the physician at point 1 who is providing V_1 nonassigned visits. Since he is currently accepting no patients on assignment, his net loss under the "none" option would be zero. If this physician elects to take all patients on assignment, on the other hand, he would not be able to bill for the difference between P_1 and R, resulting in a loss of net revenue equal to the area $(R-P_1) \cdot V_1$. Since this amount clearly is negative, we would expect physician 1 to choose the "none" option. Similarly, we would expect a physician taking his entire Medicare case load on assignment (not shown in fig. 8-1) to choose the "all" option.

8.2.2 The Impact of Collection Costs

So far, the collection of the physician's fee -- either from the patient or the government -- has been presumed costless. With no collection costs and a perfect collection rate, we observe the "ideal" demand (ACDM) and marginal revenue (ABX) curves shown in Figure 8-2. The non-discriminating physician begins accepting patients on assignment after volume exceeds V_B visits, where marginal revenue falls below R, the Medicare allowed fee.

In fact, however, the physician may experience difficulties or delays in collection. Consider trying to collect from patients first. The patient may be tardy in paying, requiring repeated prodding from the physician. Even with reminders, the patient may pay only a portion of the bill; in the extreme case, the non-assigned patient may collect $(1-\gamma)R$ from Medicare but pay the physician nothing. The net fee (NP) the physician

FIGURE 8-2: IMPACT OF COLLECTION COSTS ON THE "ALL OR NOTHING" DECISION



receives can be written as

$$NP = k(g,P) \cdot P - g$$

where $k(g,P)$ = collection rate, g = collection cost per visit, and P = the physician's gross fee. The collection rate, k, is assumed to depend positively on g and inversely on P; the more money physicians spend on collection, the higher the collection rate. Conversely, for a given collection effort, the collection rate should be lower, the higher the physician's fee. For a given demand curve, an infinite family of "net" demand and marginal revenue curves exist, one for every possible value of g.

For example, assume $g = \$1$ and $k=.7 - .002P + .05g$.* Then $NP = P(.75-.002P)-1$, and the physician's net price is a polynomial function of P, his gross price. For $P = 0$ (where demand intersects the horizontal axis), $NP=-1$. NP for $g = \$1$ is shown in Figure 8-2 as A'Y. It is shifted down from ACD by \$1 and rotated in around Y such that at $P=0$, $NP = -1$; and at $P=A$, $NP = .75A - .002A^2 -1$. If $A = \$100$, then $NP = \$54$.**

How much the physician's demand and marginal revenue curves are shifted (and rotated) inwards depends on P, k and g. In fact, for a given collection function, $k^*(g,P)$, an optimal g^* exists that maximizes net (of collection costs) revenue. The physician should be willing to spend on collection up to the point where $dNP/dg = P \cdot dk/dg-1 = 0$ or the marginal increase in the net fee equals one dollar (see Sloan, Cromwell, and Mitchell, 1978, p. 108 for a formal proof). A'Y can be thought of as an optimal net demand curve, and any other unit collection cost, $g \neq g^*$, produces a net demand curve below the maximal one. Physicians such as surgeons who have high fees should be willing to spend more on collection because the marginal return ($= Pdk/dg$) is higher. This is true in spite of the fact that their average collection rate will be lower. Collection rates will also be lower in poorer communities generally. Whether physicians serving these communities would exhibit higher collection costs would depend

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*A simple, linear specification of k implicitly assumes constant effects of P and g on collection rates. A more realistic, but unduly complicated, specification would show declining returns to expenditures on collection and more rapidly declining collection rates as fees increase.

**The net demand curve A'Y in Figure 8-2 is represented linearly, although a curvilinear form would be more representative of the polynomial relationship between P and NP. A linear representation does not change the theoretical conclusion, and was simpler graphically.

on the marginal impact that increased collection efforts would have on patient payments. If poorer patients are generally impervious to continued prodding, physicians may actually incur little or no collection costs, choosing instead to maximize the net return by keeping costs down. To collect a fixed amount from the poor, on the other hand, would necessarily require greater collection costs. It just may not be worthwhile; better to lower the amount collected than to spend collection monies in vain.

Positive patient collection costs unambiguously leads to earlier, more extensive Medicare assignment as shown in Figure 8-2. Here, the non-discriminating physician's potential assigned output increases from V_{BM} to V_{FM} with a net gain in assigned visits of $V_B - V_F$.

What impact do patient collection costs have on the all or nothing decision? In part, the impact is indirect through the assignment decision. Physicians with higher patient collection costs will have higher assigned caseloads to begin with and hence are more likely to choose the "all" option. The impact is also direct, however: by shifting the demand and marginal revenue curves inwards, high patient collection costs lower the physician's net price at every visit level. The marginal revenue curve now kinks at a lower level of Medicare output(C') than in the absence of collection costs. For physicians to the right of C', the amount patients are willing to pay them is less than $\gamma R + g$ (the coinsurance plus the per visit collection cost). These physicians will choose the "all" option rather than incur the higher net losses resulting from a reduction in usual fees below R.

Collecting from Medicare directly is generally not costless either. Assuming a constant unit cost associated with collecting from Medicare for assigned bills, the physician's net fee is reduced by a constant amount.* This is represented in Figure 8-2 as a downward shift in the Medicare allowable from R to R" by an amount $\hat{g}$, the average unit cost of collecting from Medicare. Holding patient collection costs constant

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*This ignores collection costs associated with collecting the 20 percent coinsurance from the patient. Given the small out-of-pocket burden, this should be negligible.

(i.e., g=$1 in our example), positive Medicare collection costs unambiguously reduce assignment (by $V_E - V_F$ visits according to Figure 8-2). Thus, Medicare collection costs have the same impact on the all or nothing decision as do patient collection costs, but of course in the opposite direction. Positive Medicare collection costs will put off the point at which the marginal revenue curve kinks, from C' to C", and at which the physician would choose the "all" option. Thus, physicians will still opt to take no patients on assignment at much higher levels of Medicare output than they would in the absence of Medicare collection costs.

The total effect of Medicare and patient collection costs on the willingness to accept assignment (and hence on the all or nothing decision) is ambiguous. In Figure 8-2, collection costs are shown to increase assignment by $V_B - V_E$ visits. It is conceivable that collecting from patients is relatively easier than from the Medicare carrier, thereby reducing assignment and encouraging the "none" option. Previous evidence (Sloan, Cromwell, Mitchell, 1978, p. 157) supports the contention that direct payment from Medicare reduces physician collection costs, but the advantage is small if physician self-reports are to be believed.*

8.2.3 Impact of a Medicare Fee Increase

Theory predicts that an increase in the Medicare allowed fee, R, will raise assignment rates, an impact documented empirically as well (Mitchell and Cromwell, 1981). Do higher Medicare reimbursement levels have an independent impact on the all or none decision? As discussed earlier, the probability of a physician choosing the "all" option is affected only by shifts in the downward sloping portion of the assigned marginal revenue curve (CD in Figure 8-1). Because of the coinsurance, an increase in the Medicare fee effectively raises the out-of-pocket burden for assigned patients, and assigned patients will demand fewer visits

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*The average physician reports that he would be willing to discount his bill by only about 2 percent for the privilege of direct payment.

at this new price.* This means that the second kink in the physician's marginal revenue curve (C) occurs at a lower level of total output than before the fee increase. For physicians to the right of this kink, a larger proportion of their assigned patients are now unwilling to pay the full coinsurance. Some physicians previously on the horizontal portion of their assigned marginal revenue curve will now find themselves on the downward sloping portion (CD), assuming Medicare output remains constant. These latter physicians will now choose the "all" option.

8.2.4 Joint Medicare-Medicaid Patients

The physician must accept a joint Medicaid-Medicare beneficiary on assignment or not accept any public reimbursement for him. The pool of joint Medicare-Medicaid patients will lengthen the horizontal portion of the physician's marginal revenue curve (BC in Figure 8-1), as marginal revenue equals R for all patients. (The Medicare carrier pays $(1-\gamma)R$, while the state Medicaid program is responsible for γR.) Unlike other assigned patients, these joint eligibles face no out-of-pocket price for care, and assigned demand will be perfectly inelastic. Thus where these joint patients constitute a larger share of the physician's Medicare caseload, assignment rates will also be higher. What about the all or nothing decision? Referring back to Figure 8-1, we can see that where BC is longer, C kinks at a greater level of Medicare output, thereby putting off the critical decision point. This would lead to the somewhat paradoxical conclusion that the physician is less likely to choose the "all" option. In fact, however, he does not face the same choice with his joint Medicare - Medicaid eligibles, as with the "pure" Medicare patients. Under the "none" option, this physician must either drop the joint patients from his caseload or forego any public reimbursement for them. Presumably, these patients would be willing or able to pay the physician only a small fraction of his usual fee (less than γR), if anything at all. As shown earlier, it is at this point, when the physician begins seeing Medicare patients too poor to pay even the coinsurance, that he begins to consider choosing the "all" option.

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*Say, for example, the Medicare allowed charge was $8, and the assigned patient paid $1.60 coinsurance (0.2 x $8). If the Medicare fee is increased to $10, the assigned patient must now pay $2 for the same visit (0.2 x $10).

Because there are no out-of-pocket payments, the physician will not incur any collection costs from the patient. He will still incur any expenses associated with billing Medicare directly, as well as from the state Medicaid program which is responsible for paying γR. Collection costs associated with Medicaid are identical in impact to those of Medicare: they lower the physician's marginal revenue from assigned patients, discouraging entry into the assignment market. The magnitude of their effect may be considerably larger, however; physicians have consistently cited the Medicaid program as having more onerous administrative requirements than Medicare (Sloan, Cromwell, and Mitchell, 1978). Given relatively higher collection costs associated with Medicaid, physicians may either refuse to treat joint-eligibles, or they may simply decline to bill the state agency for γR. The latter response implies that the physician would be located to the right of C (or the downward sloping portion of his assigned marginal revenue curve). In this instance, the physician would also be more willing to accept the "all" option.

8.2.5 The Medicare Market Under Price Discrimination

The preceding analyses have assumed that the physician does not price discriminate. What happens if we now assume that he is a perfect price discriminator? The marginal revenue curve becomes the demand curve and the physician is able to extract from each patient exactly what he/she is willing to pay without having to lower his fee to previous patients. The physician would move down his demand curve deriving marginal revenue greater than or equal to R at each visit level. After some point (point C in our earlier analyses), patients are willing to pay only some fraction of the coinsurance out-of-pocket and marginal revenue falls below R. The physician continues to move down along his demand curve, deriving marginal revenue such that $(1-\gamma)R \leq MR < R$. The perfect price discriminator will never choose the "all" option; any deviation from his revenue-maximizing position along the demand curve will result in loss. This is true even for those physicians to the right of C (which we showed earlier to be the critical threshhold for the "all" decision), because they need never lower their usual fee to all patients under the "none" option as would non-price discriminators.

The assumption of perfect price discrimination is a particularly strong one. More realistically, the physician can only imperfectly assess each patient's ability and willingness to pay. Under less-than-perfect price discrimination, we can imagine the old marginal revenue curve rotating out towards the demand curve, thereby putting off the point where marginal revenue falls below R and where the physician enters the assignment market. As long as the physician can price discriminate to some extent, no matter how imperfectly, he will never choose the "all" option. Even physicians to the right of C , while they may have to lower the fee charged their marginal patient below R, can continue to exact higher fees ($\geq$ R) for their remaining patients.

8.2.6 Private Demand Factors

Until now we have ignored non-Medicare demand for physician services and analyzed only demand by the elderly. The model is easily extended, however, to incorporate private, non-elderly demand. Increases in private demand are similar to those in the demand for non-assigned Medicare services; both bid the physician's time away from the assignment market. Outward demand shifts, by putting off the point at which the horizontal portion of the assigned marginal revenue curve turns downward-sloping, also reduce the probability that the physician will choose the "all" option.

Fee Schedules of Other Insurors: Medicare competes with other third-party payors for the physician's scarce time. Where other third parties offer higher levels of reimbursement, the physician will be less willing to accept Medicare patients on assignment. Although higher private fee schedules have been shown to discourage physician participation in Medicaid (Sloan, Cromwell, Mitchell, 1978), comparable studies of assignment have shown no effect (Mitchell and Cromwell, 1981).

Ability to Pay: Per capita income and assignment are hypothesized to be negatively related (Huang and Koropecky, 1978; IOM, 1976; Mitchell and Cromwell, 1981). Higher incomes will shift the physician's fee-setting demand curve outwards, thereby lowering assignment rates. Medicare coverage will raise demand for both assigned and nonassigned services; previous work suggests that, holding income constant, the demand for nonassigned

services dominates (Mitchell and Cromwell, 1981). Thus, greater Medicare coverage is hypothesized to lower assignment rates, certeris paribus.

Physician Credentials: Physicians with attributes generally associated with higher quality face a greater demand for their services in the fee-setting market and thus may be less willing to accept assignment. Physician credentials include specialty training, board-certification, whether he has a medical school faculty appointment, and whether he is a foreign medical school graduate. General practitioners, non-board-certified physicians, and FMGs are hypothesized to take more Medicare claims on assignment. While medical school faculty would be expected to accept fewer patients on assignment, they may practice in settings such as hospital OPDs with high Medicaid caseloads, where assignment is mandatory. Previous work has shown no difference in assignment rates for faculty physicians, despite their better credentials (Mitchell and Cromwell, 1981).

Physician Age: The older physician is likely to face a drop in demand for his services. Referring physicians may decline to send him new patients, preferring to recommend the services of a younger physician more fully acquainted with the latest medical techniques. The older physician may also find that his own patients are "retiring" him (Freidson, 1970). A dwindling practice load and a fall-off in referrals will encourage the aging physician to enter the price-taking market and accept assignment.

Physician Competition: Traditional economic theory predicts that the physician-population ratio will be positively related to assignment rates. As the supply of physicians increases, demand per physician falls in the fee-setting market, encouraging acceptance of Medicare patients on assignment. If physicians are able to induce demand for their services, on the other hand, then the correlation between physician supply and assignment will be zero or even negative.* Previous empirical work suggests that the relationship is in fact negative (Paringer, 1980; Mitchell and Cromwell, 1981).

8.2.7 Supply Factors

Supply factors influencing the assignment decision include billing and collection costs associated with Medicare assignment and practice costs, including an imputed wage to the physician's time. The impact of administrative costs on assignment and on the all or none decision

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*A non-positive correlation could also be explained by a rise in "quality-amenities," such as longer office visits spent with the physician.

has been discussed earlier, but we should emphasize here that assignment appears to be relatively more attractive to the physician with large bills (Ferry et al., 1980). He may be willing to trade off some positive collection costs in return for certainty of payment. Thus, surgical specialists are hypothesized to have higher assignment rates than do other specialists and general practitioners. Previous work has shown that this "collection cost" effect dominates the high private demand effect for surgeons (Mitchell and Cromwell, 1981).

Practice Costs: As wage rates rise for non-physician personnel, it is less likely that the Medicare allowed charge will provide sufficient marginal revenue to cover increased practice costs. Thus, in areas with high wage rates, physicians should accept fewer claims on assignment. Previous empirical work, however, has not been able to demonstrate such a relationship (Mitchell and Cromwell, 1981; Paringer, 1980).

A large component of practice costs is the physician's own time. Assuming Medicare assigned services yield comparatively low marginal revenue, the physician will reduce his output by reducing his caseload of assigned patients first. Physicians with substantial non-practice income or with health problems restricting their work pace should value their leisure time more highly and thus prefer to work in the fee-setting market. Older physicians may also have a relatively high time price and thus take fewer patients on assignment. At the same time private demand for their services is falling and empirical work has shown that this latter effect dominates (Mitchell and Cromwell, 1981).

Political Attitudes: Finally, physician political attitudes, especially beliefs about the role of government in medicine, have been shown to influence assignment rates. More conservative physicians are less willing to accept assignment (Mitchell and Cromwell, 1981).

8.3 Sample Description

The data base for this analysis was the combined 1975 national and regional samples. A weighting algorithm was used to make the total sample representative of the U.S. as a whole. As they almost never treat elderly patients, pediatricians were excluded from the analysis. The total unweighted sample size was 1,726 general practitioners, internists, obstetrician-gynecologists, and general surgeons.*

Over one-fifth of physicians in this sample (27.7%) reported that they never accepted any of their Medicare patients on assignment, and almost another fifth (21.1%) stated that they always did.** The remainder (51.2%) take assignment on a case-by-case basis. Besides questions on Medicare assignment rates, caseloads, and how often he tried to collect the deductible and coinsurance from his assigned patients, each physician was asked the following question:

> "If you had to make a choice between accepting
> _all_ of your Medicare patients on assignment,
> or _none_ of your Medicare patients on assignment,
> which would you choose?"

This question formed the basis for our analysis of the all or nothing decision. The analysis consisted of three components: (1) descriptive statistics illustrating the all or none decision as a function of physician characteristics, geographic location, and willingness to accept assignment; (2) econometric analysis of the decision; and (3) simulation of the impact of the all or nothing requirement on assignment rates and assigned workloads.

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*This excludes eleven physicians who reported that they had no Medicare patients in their practice, apparently choosing to treat a younger casemix.

**These estimates vary slightly from those reported in our earlier work (Mitchell and Cromwell, 1981), because OB-GYNs were included here. The inclusion of OB-GYNs raises assignment rates somewhat; like other surgeons, OB-GYNs have higher average charges per beneficiary and are more likely to take assignment.

8.4 Descriptive Analysis of the All or None Decision

8.4.1 Specialty and Current Assignment Status

When asked which they would choose if forced to take all of their Medicare patients on assignment or none of them, over two-thirds of surveyed physicians (68.5%) responded that they would choose the "none" option (see Table 8-1). Internists desert the assignment market in disproportionate numbers. Only one out of every five internists said they would take all patients on assignment compared with two out of five general surgeons and OB-GYNs. This is not completely surprising given the higher assignment rates of surgical specialists which will encourage them to choose the "all" option.

We see this more clearly in Table 8-2 which presents the all or none decision as a function of whether the physician never, always, or sometimes (i.e. on a case by case basis) takes assignment. The overwhelming majority of physicians who never take assignment choose the "none" option, as predicted by theory. Over three-fourths of physicians currently accepting all patients on assignment will continue to do so if forced to choose. Theory does not explain the relatively large number of physicians who report that they would stop taking assignment (22.4%) even though their current assignment rate is 100%. It is possible that the absolute size of their assigned caseloads is quite low, thus minimizing the net loss associated with the "none" option. Alternatively, a distaste for government regulation may lead these physicians to make a (financially) irrational choice. We explore this in more detail later.

The largest group of physicians (and the most interesting one for policy purposes) are those who currently accept assignment on a case by case, or sometimes, basis. Most of the impact of an all or nothing requirement on assignment rates and assigned workloads will be felt through this "swing group". Which option do they choose? We see from Table 8-2 that the large majority (73.2%) state they would not take any patients on assignment. Internists in the "swing group" choose the "none" option at a higher than average rate, 82 percent compared with 67 and 65 percent of general surgeons and OB-GYNs, respectively.

TABLE 8-1

ALL OR NONE CHOICE BY SPECIALTY[a]
(percent distribution)

	All	None
General Practice	31.3%	68.7%
General Surgery	40.9	59.1
Internal Medicine	20.4	79.6
OB-GYN	38.8	61.2
Total	31.5	68.5

[a] Percents sum to 100% by row.

TABLE 8-2

ALL OR NONE CHOICE AS A FUNCTION OF CURRENT ASSIGNMENT STATUS[a]
(percent distribution)

	All	None
Physician Accepts Assignment (%)		
Always (21.1%)	77.6%	22.4%
Sometimes (51.2)	26.8	73.2
Never (27.7)	5.2	94.8

[a] Percents sum to 100% by row.

8.4.2 Physician Credentials

The concern has been voiced in Congressional testimony* and elsewhere that two levels of medical care may be created as the result of an all or nothing requirement, similar to what exists now under Medicaid. Because of its low fees, the Medicaid program appears to constitute a secondary market served by less well trained physicians. (See Mitchell and Cromwell, 1980, and other chapters of this report.) Will competition for better paying elderly patients encourage only less qualified physicians to choose the "all" option? Table 8-3 suggests not. There are no differences in credentials of physicians choosing either of the options, such as board-certification, foreign versus U.S. medical school training, or faculty status. Physicians aged 60 and over are somewhat disproportionately located in the "all" group, at least in part because of low private demand for their services. Older physicians also are more likely to have assigned patients of long-standing for whom they may be reluctant to suddenly terminate the assignment of benefits.

Although credentials are equal between the two groups, the unequal distribution of specialists suggests that access to internists' services may be limited for assigned patients under an all or nothing requirement. Only one out of six physicians choosing the "all" option is an internist compared with one out of three choosing the "none" option. Yet internists are a major source of care for Medicare patients, second only to GPs, providing 19.3 percent of all office visits to the elderly (NCHS, 1978b). By contrast, surgical specialists, who are overrepresented in the "all" group, are a less important source of medical care for the elderly (particularly OB-GYNs).

8.4.3 Geographic Location

Table 8-4 presents the geographic location of physicians choosing the all and none options. Physicians in non-metropolitan areas are more willing to choose the "all" option than are their city colleagues. This is consistent with what we know about higher assignment rates in non-SMSAs, and probably reflects the relatively low demand in these areas. The elderly in rural areas, for example, are apt to be poorer and to have

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*See, for example, testimony by Nelson Cruikshank to the Select Committee on Aging, U.S. House of Representatives (1980).

TABLE 8-3

CHARACTERISTICS OF PHYSICIANS CHOOSING ALL VS. NONE

	All	None
Specialty[a]		
General Practice	40.0	40.4
General Surgery	24.6	16.3
Internal Medicine	16.4	29.5
OB-GYN	19.1	13.8
Board-Certification	38.9	37.3
Foreign Medical Graduate	11.5	11.6
Medical School Faculty	9.8	10.1
60 years and older	28.4	23.7

[a] Specialty columns sum to 100%.

TABLE 8-4

GEOGRAPHIC LOCATION OF PHYSICIANS CHOOSING ALL VS. NONE
(percentage distribution)[a]

	All	None
SMSA	28.9	71.1
Non-SMSA	38.8	61.2
North East	39.0	61.0
North Central	27.3	72.8
South	27.3	72.7
West	32.4	67.6

[a] Rows sum to 100%.

more limited supplementary insurance coverage. Thus, non-SMSA physicians probably are already accepting all of their Medicare patients on assignment, or if taking assignment on a case by case basis, they may be on the downward-sloping portion of their assigned marginal revenue curves.

Table 8-4 also shows large regional differences in the all or none decision. Physicians in the North East are far more likely to choose the "all" option than are physicians in other regions, a finding consistent with the generally high assignment rates in the North East. A surprising finding is the relatively high number of Western physicians opting to take all patients on assignment, compared with those in the South and North Central parts of the country. Previous work had shown that Western physicians were actually less willing to accept assignment, and almost never had 100 percent assignment (Mitchell and Cromwell, 1981). Demand factors not held constant here may partially explain this anomaly.

8.4.4 Political Attitudes

Previous work has shown that political attitudes influence the assignment decision, above and beyond traditional economic variables (Mitchell and Cromwell, 1981). Not surprisingly, we also observe a strong association between these attitudes and the all or nothing decision. Each physician was asked whether he agreed or disagreed with two different statements displayed in Table 8-5.* Physicians choosing the "all" option were more likely to strongly agree that health care is a right, as measured by responses to the first statement ("it is the responsibility of society..."). The majority of all physicians agreed that there are too many controls on the medical profession but the "all group" was somewhat less likely to strongly agree.

8.4.5 Collection Rates

Theory predicts that where collection rates and net fees are lower, physicians will be more likely to choose the "all" option. Based on our survey instrument, we have a direct measure of the physician's collection ratio, $k(g,P)$. Each physician was asked what percentage of patient billings the practice was able to collect during the preceding year. Although

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*These two questions were asked in the national survey only. The unweighted sample size on which these responses are based was 889.

TABLE 8-5

POLITICAL ATTITUDES OF PHYSICIANS CHOOSING ALL VS. NONE (percent distribution) [a]

	Strongly Agree	Agree Somewhat	Disagree Somewhat	Strongly Disagree
"It is the responsibility of society, through its government, to provide everyone with the best available medical care, whether he can afford it or not."				
All	24.5%	28.3%	20.7%	26.6%
None	17.5	23.7	22.6	36.3
"There are too many controls on the medical profession that interfere with taking care of patients."				
All	55.5	25.2	13.2	6.1
None	66.3	16.9	14.2	2.6

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[a] Rows sum to 100%.

TABLE 8-6

PERCENT OF PATIENT BILLINGS COLLECTED AS A FUNCTION OF THE ALL OR NOTHING DECISION (percent distribution) [a]

Percent of Bills Collected	All	None
96-100%	10.8%	22.4%
90-95%	34.9	43.7
80-89%	38.7	24.2
Less than 80%	15.6	9.7

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[a] Columns sum to 100%.

the question refers to total billings, it is probably a reasonably good measure of Medicare billings as well. Physicians in the "all" group apparently did have more difficulty in collecting patient billings than did physicians in the "none" group (Table 8-6). Only 10.8 percent of physicians choosing the "all" option reported collection ratios exceeding 95 percent, compared with twice as many of physicians declining assignment (22.4%).

Under assignment, the Medicare carrier reimburses the physician directly only for 80 percent of the allowed charge, $(1-\gamma)R$. The physician is still responsible for billing the patient for the deductible (if not previously satisfied) and for the coinsurance (γR). Each survey physician was asked in what percentage of cases they tried to collect these copayments from the patient. Given some positive collection costs, the extent to which physicians pursue copayments will reflect the expected probability of receiving them. We would thus expect physicians choosing the "all" option to be less likely to try and collect the copyaments (and hence to be on the downward-sloping portion of their MR curves).

Table 8-7 suggests that this may be the case. Physicians have been grouped first by their all or none choice, and then by their current assignment status, i.e., whether they accept 100% of their patients on assignment or whether they do so on a case by case basis. Physicians who never take assignment were not asked the copayment questions (as they would naturally bill the patient for their full fee) and hence are excluded from the table. Physicians choosing the "all" option appear somewhat less likely to pursue collection of the deductible and coinsurance. They less frequently report that they always go after the copayments; between 40.4 and 53.6 percent of the "all" group report that they always try to collect the coinsurance compared with 42.6-61.0 percent of the "none" group. The more striking difference is between physicians currently exercising the case-by-case option and those always taking assignment. The latter are much more likely to try and collect both coinsurance and deductible, probably because assigned patients constitute a much larger proportion of their total caseloads.

Earlier, in section 8.4.1, we saw that a small but substantial number of physicians who currently accept all of their patients on assignment stated they would not take any if forced to choose. This is the group in

TABLE 8-7

COLLECTION OF MEDICARE COPAYMENTS (percent distribution)[a]

	All		None	
	Case-by-Case	100%	Case-by-Case	100%
Deductible				
Never Collect	40.8 %	45.0 %	40.5 %	35.9 %
Sometimes Collect	22.4	13.1	15.9	15.4
Always Collect	36.8	41.9	43.6	48.7
Coinsurance				
Never Collect	37.8	36.2	45.5	33.9
Sometimes Collect	21.8	10.2	11.9	5.1
Always Collect	40.4	53.6	42.6	61.0

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[a] Columns sum to 100% within each type of copayment.

deceiving, however, as physicians opting for no assignment constitute the vast majority of all swing group physicians. We examine this in detail later when we simulate the impact of an all or nothing requirement on assignment rates and assigned workloads for all physicians.

the last column of Table 8-7. These physicians appear especially aggressive in collecting the copayments; they are more likely than physicians in any of the other three groups to always go after the deductible and coinsurance. Almost two-thirds (61.0%) of these physicians, for example, state they always try to collect the coinsurance compared with one-half or less of physicians in the other group.

8.4.6 Swing Group Physicians

Swing group physicians currently take some, but not all, patients on assignment. Their all or none decision will depend solely on whether they are located on the horizontal or downward-sloping portions of their assigned marginal revenue curves.

Table 8-8 examines this group of physicians (51.2% of our total sample) in more detail. Differences shown earlier between all and none physicians as a whole (see Tables 8-3 and 8-4) are somewhat magnified for the swing group. Surgical specialists are overrepresented, and internists underrepresented, in the "all" group as expected, but there are also more general practitioners. Because they include relatively more GPs, swing physicians choosing the "all" option are less likely to be board-certified and somewhat less likely to be foreign trained. Most noteworthy, they tend to be older (36% are 60 years and over vs. 24%) and to be located in non-metropolitan areas (31% vs. 25%). Again these may be specialty effects, at least in part. We will be able to test this directly in the econometric analysis.

Theory predicts that swing physicians with larger assigned caseloads are more likely to be on the downward-sloping portion of their assigned MR curves and hence to choose the "all" option. Table 8-8 bears this out: assignment rates and assigned caseloads in the "all" group are almost double those for the "none" group. This is true even though total Medicare output is only slightly higher for physicians selecting the "all" option. They provide 55 visits per week to Medicare patients on average, compared with 50 for physicians choosing the "none" option.

It might appear that the net gain in assigned visits would be considerable from the swing group physicians under an all or nothing requirement. The "all" group would more than double its average assigned caseload (from 23.4 to 54.9 assigned visits for a net gain of 21.5 visits), while the "none" group would only give up 11.5 assigned visits. These figures are

TABLE 8-8

CHARACTERISTICS AND MEDICARE WORKLOADS OF SWING GROUP PHYSICIANS

	All	None
Specialty (%)[a]		
General Practice	43.5%	39.3%
General Surgery	23.2	16.9
OB-GYN	12.9	8.9
Internal Medicine	20.4	34.8
Board-Certification (%)	36.8	41.5
Foreign Medical Graduate (%)	10.3	12.0
60 years and Older (%)	36.4	23.6
Practices in Non-SMSA (%)	31.1	25.1
Medicare Assignment Rate (%)	41.5	22.9
Assigned Visits	23.4	11.5
Total Medicare Visits	54.9	49.7

[a] Specialty distribution percentages sum to 100% by column.

8.5 Econometric Analysis of the All or Nothing Decision

8.5.1 Empirical Specification

A structural equation for the all or nothing requirement under Medicare can be specified as follows:

$$A/N = f(AR;\ MPC;\ BSF;\ CRR;\ CC;\ Y;\ INSUR;\ MDCRED;\ MDAGE;\ PRACC;\ MDPOP;\ POLIT)$$

where A/N = all or nothing decision

AR = physician's assignment rate,

MPC = Medicare prevailing charge,

BSF = Blue Shield fee,

CRR = carrier rate of reduction,

CC = collection costs,

Y = per capita income,

INSUR = health insurance coverage,

MDCRED = vector of physician credentials,

MDAGE = physician age,

PRACC = physician practice costs,

MDPOP = physician-population ratio,

POLIT = physician political attitudes.

Variable definitions and means are presented in Table 8-9. All monetary variables are adjusted for geographic cost-of-living differences (IOM, 1976).

Dependent Variable: The dependent variable is specified as a dichotomous variable (A/N) in which "one" signifies that the physician chooses the "all" option, and "zero", the "none" option.

Independent Variables - Assignment Rates: The physician's assignment rate (AR) is the percentage of Medicare patients' bills taken on assignment. Higher assignment rates increases the probability that the physician will elect to take all patients on assignment. AR is an endogenous recursive variable, as it is determined by the other demand and supply variables (D,S) in the equation, as we see below.

$$\begin{tikzcd} & AR \arrow[dr] & \\ D,S \arrow[ur] \arrow[rr] & & A/N \end{tikzcd}$$

TABLE 8-9

VARIABLE MEANS AND DEFINITIONS - ALL OR NOTHING ANALYSIS

Variable	Definition	Mean
A/N	whether the physician chooses to accept all patients on assignment (A/N = 1) or none (A/N = 0)	0.31
AR	assignment rate (percent of all claims accepted on assignment)	35.35
MPC	Medicare prevailing charge for a follow-up office visit	10.45
BSF	Blue Shield fee for follow-up office visit	8.62
CRR	carrier rate of reduction	0.73
PTCOLL	physician is able to collect more than 95% of patient billings	0.19
DENY	proportion of all assigned claims that are denied	0.06
INVEST	proportion of all assigned claims that are investigated	0.07
CLAIMSP	state Medicaid program has fiscal agent for claims processing	0.56
Y	per capita income (in 000's)	5.35
OVER65	proportion of persons aged 65 and over	0.10
SSI	SSI recipients as proportion of all elderly	0.24
GS	physician is general surgeon	0.19
OB	physician is OB-GYN	0.15
IM	physician is internist	0.25
BOARD	physician is board-certified	0.38
FMG	foreign medical graduate	0.12

TABLE 8-9 CONT.

Variable	Definition	Mean
FAC	physician is medical school faculty member	0.10
MDAGE	physician's age	52.80
MDAGESQ	physician's age squared	2894.75
PRACY	physician has nonpractice income of $10,000+	0.14
RESTRICT	physician has restricted his practice for health reasons	0.13
WAGE	wage rate for nonphysician personnel	3.75
MDPOP	physician-population ratio	1.21

We include these other variables in order to measure their marginal contribution to the all or nothing decision, above and beyond their influence on the assignment rate itself. In order to better assess the indirect impact of certain variables, such as Medicare fees, we will also estimate an assignment rate equation. This equation specification is virtually identical to the all or nothing equation, but with AR now on the left-hand side. (See Mitchell and Cromwell (1981) for a detailed description of the assignment model.)

Fee Schedules: Two variables are included to measure the influence of relative fee schedules: the Medicare prevailing charge for a follow-up office visit (MPC) and Blue Shield's maximum allowed payment for the same procedure (BSF).* The Medicare prevailing charge is defined for the physician's reasonable charge locality and was obtained from the 1976 Medicare Directory of Prevailing Charges. The Blue Shield fee was constructed from physician self-reported survey data and is defined for the physician's Blue Shield plan area. As these responses may reflect an area's specialty mix, individual physician responses were weighted by national proportions of physicians in each of the four specialties. The "all" decision is hypothesized to be positively related with the Medicare prevailing charge, and negatively with the Blue Shield fee schedule.

Some physicians are reimbursed at less than the prevailing charge (if their customary charge, as determined by Medicare, is lower), and in these instances MPC will not capture the relative generosity of Medicare carriers. In order to capture this, we also included the carrier rate of reduction (CRR), i.e. the percent of times the Medicare payment is less than the physician's charge. This variable, although defined for a fairly large area (carrier-wide), does provide a partial measure of the physician's net fee. The higher the carrier rate of reduction, the less likely the physician will choose the "all" option.

Collection Costs: Three kinds of collection costs are included: costs associated with collecting payment from the patient, from the Medicare carrier, and (in the case of joint eligibles) from the state Medicaid agency. While we do not have a measure of the actual cost associated with collecting from patients (g, in our theory), we do have a measure of

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*As seen in Table 8-9, the Medicare prevailing charge is larger than the Blue Shield fee, rather than smaller as expected. In part, this may be because prevailing charges were obtained from secondary data and the Blue Shield fees from physician self-reports. In addition, the prevailing charge is the maximum allowed charge and thus may exceed the average allowed charge under Medicare.

k(g,P), the physician's collection ratio. Each physician was asked what percentage of patient billings he collected during the preceding year: 96-100%, 90-95%, 80-89%, or less than 80%. PTCOLL was specified as a dummy variable set equal to one if physicians were able to collect more than 95 percent of billings, and zero otherwise. Where collection rates are lower, thus reducing net fees, physicians are hypothesized to be more willing to chose the "all" option.

Two measures of the administrative burden associated with Medicare assignment were available by Part B carrier for assigned claims in 1976: (1) claims investigation rates (INVEST); and (2) denial rates (DENY). Physicians are hypothesized to be more willing to select the "all" option when these costs are lower, ceteris paribus.

Additional collection costs may be incurred for joint Medicare-Medicaid beneficiaries, as the physician must bill the state Medicaid program for the deductible and coinsurance. In states where the Medicaid program has an outside fiscal agent responsible for claims processing (CLAIMSP), payment delays will be shorter, encouraging the physician to treat joint patients and to bill for the coinsurance. In these instances, the physician's mandatory assigned caseload will be larger and he will be more willing to choose the "all" option. CLAIMSP is hypothesized to be positively related to the "all" decision.

Ability to Pay: Two variables measure ability to pay: income and health insurance coverage. Income (Y) is defined as per capita income in the physician's county and is hypothesized to shift the fee-setting demand curve outwards, thus discouraging the choice of 100% assignment.

Both Medicare and Medicaid provide health insurance coverage for the elderly. Medicare coverage is defined as the proportion of persons aged 65 years and over in the physician's county (OVER65), and raises demand for both assigned and nonassigned services. The net effect on the probability of choosing the "all" option is clearly negative. In communities with a disproportionately larger elderly population, the downward sloping portion of the demand curve shifts outward, allowing the physician to draw upon a larger pool of nonassigned patients before entering the assignment market. The horizontal (assigned) portion of the curve also lengthens, putting off the point where patients are no longer willing to pay the full coinsurance.

The physician is hypothesized to be more willing to choose the "all" option in those areas where he faces a larger pool of joint Medicare-Medicaid beneficiaries. No data on Medicaid enrollments for the elderly are available below the state level, but data on the percentage of elderly population receiving SSI payments (and hence categorically eligible for Medicaid) are available by county from the City and County Data Book. SSI is defined as the ratio of SSI recipients to all elderly.

Physician Credentials: Four variables measuring the physician's credentials will influence the "all" decision: specialty, board-certification, FMG status, and whether he is a faculty member of a medical school. Specialists face a higher demand for their services in the fee-setting market, and thus are less likely to take all patients on assignment than are general practitioners. Offsetting this demand effect is a collection effect, i.e., the apparent willingness of physicians with large bills to take assignment in order to guarantee payment. We know from previous work however, that the latter effect dominates. Thus, internists (IM) are hypothesized to be less willing than GPs to choose the "all" option, and general surgeons (GS) and obstetrician-gynecologists (OB) are hypothesized to be more willing.

Board-certified physicians, U.S. medical school graduates, and medical school faculty are generally considered to be of higher technical quality, and hence face a greater private demand for their services. As a result, they are hypothesized to be less likely to choose the "all" option. (Offsetting this demand effect for medical school faculty, however, is their greater likelihood of practicing part-time in hospital OPDs. Because assignment is mandatory in these instances, faculty may choose to take all patients on assignment.) BOARD, FMG, and FAC all assume the value one if the physician is board-certified, if he is a FMG, or if he is a member of a medical school faculty.

Physician Age: More experienced physicians may be less willing to choose 100% assignment, because of their higher implicit wage. As physicians age, however, demand for their services may fall in the private market. In this instance, the probability of an "all" choice will be higher. Because we expect the relationship to be U-shaped, physician age will be specified both in linear and squared form. If the wage effect dominates through late middle age with the demand effect becoming more important in later years, we would expect the MDAGE and MDAGESQ variables to be positive and

negative, respectively.

Practice Costs: Practice costs include the cost of the physician's time and the wage rate for nonphysician personnel. Physicians with nonpractice incomes over $10,000 (PRACY), and physicians who report that health problems have restricted their practice (RESTRICT) are hypothesized to value their leisure time more highly, and thus be less willing to take all their Medicare claims on assignment.

When wage levels are high, physicians will be less willing to the "all" option. WAGE is defined as a county index of hourly wage rates of nonphysician personnel.

Physician-Population Ratio: MDPOP is defined as the number of office-based physicians per 1,000 county population. As this ratio rises, competition among physicians for private patients increases and private demand shifts in, encouraging assignment. MDPOP is thus hypothesized to be positively related to the "all" decision. A negative (or zero) coefficient, on the other hand, could be interpreted as evidence that physicians can protect their workloads by inducing demand for non-assigned services.

Political Attitudes: In order to examine noneconomic factors that may influence the all or nothing decision, we included two variables measuring physician political attitudes: whether the physician strongly agreed or strongly disagreed with the statement that "it is the responsibility of society, through its government, to provide everyone with the best available medical care, whether he can afford it or not". As regional sample physicians were not asked the the political attitude questions, the regression equations were estimated for the national sample alone. Neither attitudinal variable was significant in the all or nothing equation, and are not presented.

8.5.2 Estimation Methods

With a qualitative, zero-one, dependent variable (none = 0, all = 1), ordinary least squares are inefficient because of the concentration of values at the two extremes. Multivariate probit analysis is preferred because it constrains the predicted values of the dependent variable to the unit (0,1) interval (Goldberger, 1964). In the probit model, the conditional expectation is given by

$$E(y_i|\hat{I}_i) = \text{Prob}\ (y_i=1|\hat{I}_i) = F(\hat{I}_i),$$

where y_i = zero or one, depending on whether the physician chooses all or none

$\hat{I}_i$ = predicted value of index $(\Sigma\beta_i X_i)$

$F(\cdot)$= cumulative normal distribution

The conditional probability of the physician choosing the "all" option (i.e. y_i=1) can be determined by looking up values of $\hat{I}_i$ in a cumulative normal distribution table.

We also want to estimate an assignment rate equation, in order to better see the indirect effect of certain demand and supply variables on the all or nothing decision (via AR). From descriptive results presented earlier, we know that AR is not normally distributed but shows concentrations at upper and lower bounds, i.e. some physicians take all patients on assignment (AR = 100) and some take none (AR = 0). In this instance, two-limit probit (2LP) is generally the preferred technique (Rosett and Nelson, 1975). However, because two-limit probit is a costly computation technique and because the AR equation is of secondary importance for this analysis, we have chosen to estimate it using OLS. Furthermore, in assignment work conducted earlier, 2LP results did not vary substantially from those done with OLS (Mitchell and Cromwell, 1981).

8.5.3 Econometric Results

Three regression equations are shown in Table 8-10. Equation (8.3) presents OLS estimates of the percent of Medicare patients taken on assignment, while eq. (8.5) explains the all or nothing decision using probit analysis. OLS regression results (eq. 8.4) are included for comparative purposes with the probit equation; where there are differences, greater reliance should be placed on the probit results. By comparing eqs. (8.3) and (8.5), we can see that some variables, while highly significant predictors of assignment rates, have no marginal impact on the all or nothing decision, once AR is held constant. Because assignment levels are the single most important determinant of the all or none choice, these variables (e.g. the Medicare prevailing, physician specialty, etc.) do exert an indirect effect.

These indirect effects are shown more clearly in Table 8-11; they were calculated by substituting eq. (8.3) into eq. (8.5). Partial elasticities represent the direct short-run impact of the independent variable on the all or nothing decision (eq. 8.5). Total elasticities capture both direct and indirect impacts. Marginal effects, rather than elasticities, were calculated for discrete, dummy variables; they simply give the absolute change in the probability of an "all" decision associated with positive values of the discrete independent variable. Thus, being an FMG lowers the probability by 6.79 percentage points, ceteris paribus, relative to U.S. medical graduates (around a mean of 31 percent).

As expected, assignment rates have a powerful impact on the all or nothing decision. Physicians who have higher assigned caseloads to start with are significantly more likely to choose the "all" option. The estimated elasticity associated with the AR variable is 0.80, suggesting that the physician's decision is highly responsive to his current participation in the Medicare market. Physicians who accept one-half of their patients on assignment are twice as likely to choose the "all" option as are physicians who take only one out of five patients on assignment.

Relative fee schedules do not appear to directly influence the all or nothing decision; both the MPC and BSF variables are insignificant.

TABLE 8-10

REGRESSION RESULTS FOR ALL OR NOTHING ANALYSIS

Dependent Variable

Independent Variable	AR OLS (8.3)	A/N OLS (8.4)	A/N Probit (8.5)
AR	--	0.61***	0.02***
MPC	2.63***	-0.01	-0.01
BSF	-0.55	0.01	-0.003
CRR	-141.36***	-0.38*	-1.92*
PTCOLL	-11.23***	-0.07**	-0.37**
DENY	-23.94	-0.20	0.14
INVEST	-181.42***	0.30	2.51
CLAIMSP	2.70	0.01	-0.0002
Y	-5.93***	0.005	-0.001
OVER65	-323.06***	-0.79	0.04
SSI	19.71**	0.27**	1.54**
GS	10.17***	0.04	0.14
OB	10.16***	0.02	0.08
IM	-7.45**	-0.03	-0.14
BOARD	1.43	-0.02	0.01
FMG	9.42***	-0.07**	-0.40**
FAC	-0.99	0.01	-0.003
MDAGE	-1.41*	-0.01	-0.0005
MDAGESQ	0.02**	0.0001	0.00001
PRACY	-8.54***	0.05*	0.14
RESTRICT	-10.63***	0.01	0.005
WAGE	-10.12***	-0.13***	-0.59***
MDPOP	-1.43	-0.01	-0.05
CONSTANT	257.44	1.01**	2.07
	$R^2(c) = 0.18$ $F(22,1698) = 18.2$***	$R^2(c) = 0.34$ $F(23,1601) = 36.7$***	

***Significant at one percent level.
 **Significant at five percent level.
  *Significant at ten percent level.

Higher Medicare prevailing charges do indirectly encourage physicians to choose the "all" option, however, by raising assignment rates. The estimated total elasticity implies that a 10 percent increase in the Medicare prevailing will increase the probability of a physician choosing the "all" option by 6 percent.

The Medicare prevailing is only a partial measure of carrier generosity; the physician's net fee is also determined by how frequently the allowed payment is less than his usual charge, or the carrier rate of reduction. Physician willingness to choose the "all" option appears to be highly sensitive to this rate; the CRR variable is negative and quite elastic, -1.63. The probability of physicians choosing "all" in areas with a carrier rate of reduction one standard deviation above the mean (CRR=0.79) is 23 percent lower than in areas where the carrier rate of reduction is one S.D. below the mean (0.68). This is the direct impact only; high carrier rates of reduction further lower the probability of selecting the "all" option by depressing assignment rates in the first instance (see eq.8.3). As seen in Table 8-11, the total impact is quite large: -3.61.

Theory predicts that positive patient collection costs will increase the likelihood of choosing the "all" option, not only by encouraging assignment but also by lowering the physician's net price (through an inward shift in his demand and marginal revenue curves). The regression results bear this out; even holding AR constant, high collection ratios (implying low patient collection costs) lower the physician's willingness to select the "all" option. The estimated marginal effect for PTCOLL implies that the probability of an "all" choice is about 11.5 percentage points lower for physicians who are able to collect better than 95 percent of their billings than for physicians with lower collection ratios. This probability is lowered even further when the long-run effect (through assignment levels) is included: almost 17 percentage points *in toto*. Three other collection costs variables also had been included but were not significant in eq.(8.5): the financial burden associated with Medicare assignment (DENY, INVEST) and with Medicaid (CLAIMSP). Higher claims investigation rates do depress assignment levels, however, thus exerting an indirect (negative) effect on the all or nothing decision, but the associated elasticity for the INVEST variable is quite low.

TABLE 8-11

IMPACT OF SELECTED EXPLANATORY VARIABLES ON THE ALL OR NOTHING DECISION

Independent Variable	Indirect Effect	Direct Effect	Total Effect	Partial Elasticity	Total Elasticity
AR	--	0.02	0.02	0.80	0.80
MPC	0.05	-0.01[a]	0.04	-0.10	0.60
CRR	-2.83	-1.92	-4.75	-1.63	-3.61
PTCOLL	-0.22	-0.37	-0.59	-11.52[b]	-16.78[b]
INVEST	-3.63	2.51[a]	-1.12	0.21	-0.09
SSI	0.39	1.54	1.93	0.40	0.57
FMG	0.19	-0.40	-0.21	-12.03[b]	-6.79[b]
WAGE	-0.20	-0.59	-0.79	-2.47	-3.24

[a] This effect was not significant.

[b] Actually a marginal effect, rather than an elasticity.

As expected, physicians are significantly more likely to take assignment and to choose the "all" option when the pool of joint Medicare-Medicaid patients is larger. Here, the all or none choice has a somewhat different meaning: Accept assignment or lose the privilege of any Medicare reimbursement for joint eligible patients. A ten percent increase in the Medicaid-eligible elderly population (SSI) raises the probability of an "all" choice by 4 percent (around a mean of 31%). This impact increases by half, to 6 percent, when the indirect effect of SSI on assignment rates is included.

The other two community demand variables were insignificant in the all or nothing equation, but had the expected impact on assignment rates. Higher incomes (Y) and larger Medicare populations (OVER65) exert a net depressing effect on assignment levels (through outward shifts in demand), and thereby indirectly reduce the likelihood of an "all" choice.

Four variables were included to measure physician credentials: specialty, board-certification, faculty status, and medical training. None of the specialty variables were significant predictors of the all or nothing decision, all of their impact coming through assignment levels. As expected, foreign medical graduates are more likely to accept assignment (eq. 8.3), but surprisingly are less likely to choose the "all" option, once assignment levels are held constant (eq. 8.5). The net estimated marginal effect for the FMG variable is still negative, but somewhat smaller, when both direct and indirect impacts are included (6.8 versus 12.0 percentage points). The remaining credential variables (BOARD, FAC) were not significant.

It had been hypothesized that where practice costs (including the cost of the physicin's own time) were higher, physicians would be less willing to treat low marginal revenue (e.g., assigned) patients. In fact, physicians with higher time prices are no less likely to choose the "all" option, the impact of time price variables (MDAGE, MDAGESQ, PRACY, RESTRICT) coming indirectly through assignment rates. Younger physicians, physicians with large non-practice incomes, and those with health problems all have lower assignment rates as predicted. High wage levels for nonphysician personnel not only depress assignment levels (eq. 8.3), but also have a direct effect on the all or nothing decision

(eq.8.5). The WAGE variable is negative and highly elastic, -3.24 overall.

Finally, the physician-population ratio appears to have no impact on the all or none decision, either directly or indirectly through assignment rates. As increased competition for private patients was hypothesized to encourage assignment, the zero MDPOP coefficients could be interpreted as evidence that physicians are able to protect their non-assigned workloads through inducement.

8.6 Simulation Analysis of the All or Nothing Decision

8.6.1 Simulation Methods

In the preceding sections, we have described the characteristics of physicians choosing the "all" versus "none" options and analyzed the factors influencing their decision. Although we know that the majority of physicians would take none of their Medicare patients on assignment if forced to choose, we have not estimated the impact of this decision. Access to assigned services will depend not only on the physician's choice but also on his current Medicare caseload. If, for example, physicians choosing the "all" option have higher Medicare caseloads to start with, the net effect of an all or nothing requirement on total assigned visits may be positive. Because of data limitations, we must assume that the physician's Medicare caseload remains constant, regardless of which option he selects.

Using physician responses to the all-or-nothing decision, we can simulate the impact of such a requirement on the average assignment rates in the United States and the total number of Medicare assigned visits. Let

$$(8.6) \quad AR_i = MED_{ai}/MED_i$$

be the assignment rate for the i-th sample physician, where AR_i = assignment rate, MED_{ai} = Medicare assigned patients, and MED_i = total Medicare visits, assigned or otherwise. The assignment rate for the U.S. can be written as a weighted average of the assignment rates for each physician, i.e.,

$$(8.7) \quad AR_{US} = \sum \frac{MED_i}{MED_{US}} \cdot AR_i = \sum \frac{MED_{ai}}{MED_{US}}$$

Assuming the i-th physician's share of total Medicare patients in the U.S. is unaffected by his all or none decision (i.e., $MED_i/MED_{US}=K$), changes in the U.S. assignment rate can be simulated by plugging in responses to the all-or-nothing question into eq. (8.7). Similarly, changes in the aggregate supply of assigned visits can be derived using ΣMED_{ai} in eq. (8.7).

8.6.2 Simulation Results

The average assignment rate in our sample of physicians was 34.9 percent*. Substituting in the all or nothing responses, we obtain a new assignment rate of 31.5 percent. Thus, the introduction of an all or nothing requirement does result in a net decline in assignment rates, but the reduction is fairly modest, -9.7 percent. From this estimate alone, however, we can not determine the extent to which access to assigned services would actually be constrained, or whether certain types of services or parts of the country would be affected more than others.

Determining the change in the supply of assigned visits is similar to that done for assignment rates. For policy purposes, however, we are interested in knowing what group of physicians are primarily responsible for any change in assigned visits. Table 8-12 presents total Medicare caseloads, and assigned caseloads before and after the all or nothing decision for six physician groups. These groups are defined by : (1) whether the physician currently never, sometimes, or always takes assignment, and (2) whether he chooses the "all" or "none" option. Groups 2 and 5 correspond to the two swing groups described earlier : physicians who accept assignment on a case-by-case basis but who now must choose one or the other. Table 8-12 also presents the total weekly supply of assigned visits for physicians in our sample, before and after the all or nothing choice. The final column provides the gain (or loss) in aggregate supply after the all or none decision for each physician group.

Based on these findings, the total weekly supply of assigned visits would fall by 1,333 visits or 5.8 percent. If we inflate our sample to physicians nationally and multiply by average weeks worked, this implies an annual loss of 5.4 million assigned visits.** Thus while a reduction

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*This assignment rate is considerably lower than the 50 percent rate nationwide reported by HCFA (Ferry et al., 1980). This is primarily due to the fact that our assignment measure is unweighted by physician charges. We know, for example, that physicians with higher average charges per beneficiary (such as surgeons) are more likely to accept assignment.

**In 1975, the elderly made 68.7 million office vists to the four specialties included in our sample (NCHS, 1978b). The vast majority of these visits were undoubtedly covered by Medicare.

TABLE 8-12

IMPACT OF ALL OR NOTHING DECISION ON ASSIGNED VISITS PER WEEK: SIMULATION RESULTS

Prior Assignment Status	Choice	Group	∑Weights	Old Assigned Caseload/MD	Total Medicare Caseload/MD	New Assigned Caseload/MD	∑Old Assigned Caseloads	∑New Assigned Caseloads	Gain (loss)
Never	All	1	19.4	0.0	40.0	40.0	0	776	776
Sometimes		2	184.5	23.4	54.9	54.9	4,313	10,131	5,818
Always		3	218.5	49.7	49.7	49.7	10,866	10,866	no Δ
Never	None	4	336.4	0.0	42.0	0.0	0	0	no Δ
Sometimes		5	498.2	11.5	49.7	0.0	5,738	0	(5,738)
Always		6	63.5	34.5	34.5	0.0	2,189	0	(2,189)
	Total		1320.5	--	--	--	23,106	21,773	(1,333)

in assigned visits of almost 6 percent may seem fairly small, the absolute number of visits (and patients) affected is quite large. For every previously assigned visit the physician now declines to accept, the out-of-pocket liability to the patient is increased by some (indeterminate) amount.

Earlier, we had suggested that the net change in assigned caseloads would be determined largely by swing group physicians; the remaining physicians who always or never took assignment were hypothesized to choose the "all" and "none" options, respectively. In fact, the gain in assigned visits yielded by swing group physicians choosing the "all" option (group 2) is almost perfectly offset by the loss in assigned visits occasioned by those choosing "none" (group 5). Although there are more than twice as many physicians in group 5 as group 2, their smaller assigned caseloads soften the impact of their "none" decision. It is group 6 that is primarily responsible for the net decline in assigned visits: the theoretically anomalous group of physicians who had accepted all of their patients on assignment but stated they would not take any if forced to choose. This group, although only 4.8 percent of the sample, provided 9.5 of the assigned visits before the all or none choice. Compared with those in group 3, these physicians are more likely to be surgeons, to be board-certified, and to be foreign-trained. Attitudinal differences are particularly marked; group 6 physicians are twice as likely to strongly disagree that medical care is a right, 40 percent compared with 23 percent of physicians in group 3.

We know that surgical specialists are more likely to choose the "all" option, largely as a result of their higher assignment rates to start with. Does this mean that access to surgical services will be enhanced relative to medical services for assigned patients? Table 8-13 suggests not. Assignment rates fall for all specialties following the introduction of an "all or nothing" requirement, but much less so for general practitioners; absolute levels remain high as expected though for general surgeons and OB-GYNs. Changes in assigned caseloads, on the other hand, show a surprisingly wide range. The mean supply of assigned visits actually increases 11.3 percent for general practitioners, while decreasing for all other specialties. It thus becomes readily apparent that, if not for this positive response

TABLE 8-13

SIMULATION RESULTS BY SPECIALTY

Specialty	Old Assignment Rate (%)	New Assignment Rate (%)	Percent Change	Old Assigned Caseload/MD[a]	New Assigned Caseload/MD[a]	Percent Change
General Practice	32.5	31.3	-3.7	17.7	19.7	+11.3
General Surgery	46.1	40.9	-11.3	26.2	22.5	-14.1
Internal Medicine	23.9	20.4	-14.6	14.8	13.0	-12.2
OB-GYN	45.3	38.8	-14.3	8.5	6.4	-24.7
All	34.9	31.5	-9.7	17.5	16.5	-5.8

[a] Visits per week.

by GPs, the total reduction in assigned visits would be much larger than the 5.8 percent shown in Table 8-12.

Will an all or nothing requirement restrict access to assigned services in some parts of the country more than others? Table 8-14 presents assignment rates and assigned caseloads by census region and urban/rural location. With the exception of the North Central region where almost all rural physicians chose the "none" option, rural areas generally show smaller reductions in the supply of assigned visits, and nationwide have a modest increase, 3.4 percent. Western physicians in both urban and rural areas exhibit a phenomenal increase in assigned visits, 44.7 percent more than in the absence of an all or nothing requirement. This percent change is somewhat misleading, however, as it is due in large part to their low assigned caseloads to start with. Western physicians would still average fewer assigned visits per week than physicians in other regions.

TABLE 8-14

SIMULATION RESULTS BY GEOGRAPHIC LOCATION

Location	Old Assignment Rate (%)	New Assignment Rate (%)	Percent Change	Old Assigned Caseload/MD[a]	New Assigned Caseload/MD[a]	Percent Change
North East	47.1	39.1	-17.0	20.0	17.5	-12.5
Urban	47.2	38.5	-18.4	19.8	17.1	-13.6
Rural	46.5	42.9	-7.7	21.3	20.3	-4.7
North Central	30.5	27.3	-10.5	13.5	13.1	-3.0
Urban	32.2	29.5	-8.4	14.1	14.3	+1.4
Rural	13.6	5.0	-63.2	4.0	0.4	-90.0
South	33.5	27.4	-18.2	22.1	19.8	-10.4
Urban	19.3	13.0	-32.6	8.9	4.3	-51.7
Rural	47.4	41.2	-13.1	34.8	34.6	-0.6
West	23.9	32.0	+33.9	7.6	11.0	+44.7
Urban	27.5	30.2	+9.8	8.6	10.2	+18.6
Rural	7.6	40.0	+426.3	3.0	14.8	+79.7
All Urban	33.0	29.1	-11.8	13.8	12.2	-11.6
All Rural	39.3	38.4	-2.3	26.2	27.1	+3.4

[a] Visits per week.

9.0 CHARACTERISTICS, EARNINGS, AND PRACTICE PATTERNS OF BLACK PHYSICIANS

9.1 Introduction

Earlier in Chapter 4.3, we saw that physicians with large Medicaid-Medicare practices were more likely to be black physicians. These physicians may be found in the public market in disproportionate numbers, because of low private demand for their services. The sources for this low demand could be either legitimate (fewer qualifications) or illegitimate (discrimination by patients or referring physicians). Once specialty, credentials and other variables are held constant, however, black physicians were still significantly more likely to treat Medicaid and Medicare assigned patients (see Chapter 7.3). Of course, black physicians are more apt to treat black patients who in turn are more likely to be Medicaid or Medicare-assigned beneficiaries.*

Nevertheless, for whatever reason, these findings suggest that black physicians bear a disproportionate share of the responsibility for the nation's poor. What effect does this have on their incomes and practice patterns? Little data have been available on these aspects of black physicians' practices, especially at a national level. Surveys of National Medical Association members have primarily been limited to data on specialty, geographic location, and type of employment. (See, for example, Haynes, 1969; Reitzes and Elkhanialy, 1976; Thompson, 1974.) In this chapter, we present an exploratory case study of black physicians focussing on characteristics, earnings, and practice patterns.

The data base for this analysis was the combined 1975 national and regional samples. A weighting algorithm was used to make the total sample representative of the U.S. as a whole. The total unweighted sample size was 2,023 general practitioners, general surgeons, internists, OB-GYNs, and pediatricians, including 50 black physicians. These

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*The vast majority (87%) of all visits to black physicians are made by black patients. Because of the small supply of black physicians, however, most black patient visits (90%) actually take place with white physicians (Koba Associates, 1979).

black physicians represent 1.6 percent of the weighted sample of physicians, a number consistent with that reported elsewhere (Thompson, 1974). Findings reported here may differ somewhat from those cited in other surveys of black physicians, primarily because the 1975 survey was limited to private, office-based, fee-for-service physicians. Compared to white physicians, black physicians are more likely to be salaried and to be employed in non-patient care settings (Gray, 1977; Thompson, 1977). Because of the small (absolute) number of black physicians in our sample, no significance tests were conducted.

9.2 Physician Credentials and Characteristics

Table 9-1 shows dramatic differences in specialty mix between black and white physicians. Black physicians are much more likely to be general practitioners (45.5% vs. 35%), a finding consistent with other data (Gray, 1977). They also are more likely to be OB-GYNs, but less frequently internists or pediatricians. The higher rate of OB-GYN specialization among black physicians undoubtedly reflects the higher demand for their services by black patients. National Ambulatory Medical Care (NAMC) survey data shows that black patients are disproportionately females aged 15-44 and that pregnancy is the single most common reason for an office visit (NCHS, 1979). Visits to OB-GYNs accounted for 11 percent of all black patient office visits, compared with 8.4 percent of visits generally.

Previous work has shown that black physicians have lower rates of board-certification (Haynes, 1969), a finding also demonstrated here. Because the black physician sample includes a disproportionate number of general practitioners (who are not eligible for certification), we adjusted their board-certification rate in order to make the two rates more comparable.* The adjustment actually has the effect of widening the certification gap between black and white physicians. There are no differences, however, in the proportion of physicians with a faculty appointment to a medical school.

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*Specialty-specific board-certification rates for black physicians are adjusted using the white physician specialty mix as weights. We use the same methodology later in adjusting net incomes and wages.

TABLE 9-1

PHYSICIAN CREDENTIALS AND CHARACTERISTICS BY PHYSICIAN RACE

	Physician Race	
	White	Black
Specialty:		
General Practitioner	35.0%	45.5%
General Surgeon	16.1	17.1
Internist	22.6	6.1
OB-GYN	14.5	23.7
Pediatrician	11.8	7.6
Board Certification	42.5	37.6/29.6[a]
Faculty Appointment	11.7	11.7
Medical School:		
Howard or Meharry	0.1	80.7
Other American	89.0	17.7
Foreign	10.9	1.6
Age:		
< 40 years	11.3	0.3
≥ 60 years	25.3	36.9
Sex:		
Female	4.8	10.6
Practice Type:		
Solo	66.4	81.7
Group	33.6	18.3

[a] Adjusted for white physician specialty mix.

The important role of black medical schools in training black physicians is also seen in Table 9-1. Over three-fourths (80.7%) of black physicians graduated from the same two schools: Howard and Meharry. The remaining black physicians were primarily trained in other American medical schools. By contrast, one out of every ten white physicians received his medical education outside the U.S.

Black physicians in our sample tend to be older than their white colleagues; over one-third (36.9%) are aged 60 years or more, compared with one-fourth of other physicians. In part this may reflect the relatively greater number of GPs (who are usually older) among black physicians. Black physicians are twice as likely to be women, 10.6 percent compared with 4.8 percent of white physicians. This surprising finding has been noted elsewhere (e.g. Gray, 1977) but never explained.

Finally, black physicians are more likely to practice alone rather than in groups, 81.7 percent versus 66.4 percent. In part, this is undoubtedly a function of their age and specialty distribution; older physicians and GPs are more likely to be in solo practice. Because of discrimination, furthermore, a black physician may be unable to join with white physicians in forming a group practice, and other local black physicians may not be available. Previous work has suggested that black physicians are less likely to choose group practice (Sloan, Cromwell, Mitchell, 1978).

9.3 Patients and Caseloads

If black physicians face low demand for their services, then we would expect them to treat lower paying patients in disproportionate numbers. Table 9-2 confirms that black physicians treat considerably more minority, poor, and public program patients. One-half of their practice is devoted to black and Hispanic patients, compared with 16 percent of white physicians' practices. Based on NAMC survey data, we would have expected the percent of practice black to be much higher than the 43 percent shown here. In fact, approximately one-third of black physicians reported a patient mix more comparable to that of white physicians (i.e. black patients represented 10% or less of their practice). Differences in sampling methodology between the HCFA-NORC and other surveys may partially explain this finding.

TABLE 9-2

PATIENT CHARACTERISTICS BY PHYSICIAN RACE

	Physician Race	
Percent of Caseload	White	Black
Black	11.1%	43.1%
Hispanic	4.9	7.4
Low Income	23.4	50.6
Uninsured	14.5	14.7
Medicaid	11.9	29.3
Medicare	23.4	14.7
Medicare on Assignment	29.7	54.9

Although black physicians report that they treat twice as many low income patients as do white physicians, there are no differences in the uninsured portion of their respective caseloads. This appears to be due largely to the Medicaid eligibility of these poor patients. Black physicians report average Medicaid caseload shares of 29.3 percent, almost three times the size that of white physicians. They see considerably fewer Medicare patients, but this is undoubtedly due to the relatively low demand of elderly black patients (NCHS, 1979). When black physicians do treat Medicare patients, however, they are far more likely to take them on assignment. The total public program share of their caseloads can be calculated by summing the Medicaid and Medicare assigned portions. Black physicians devote more than twice as much of their practice to their public program patients as do white physicians (39.4% vs. 18.9%). As public reimbursement rates are generally well below the prevailing private fees, the larger public share of black physicians should have a depressing effect on their earnings (holding workloads constant). We examine this in detail in Section 9.4.

Although total caseloads are no different between the two groups, black physicians work harder, spending six hours more per week on average (Table 9-3). At least part of this additional work effort can be attributed to slightly longer office visits; black physicians spend about two minutes more with each office patient, compared with white physicians. Longer work weeks may also reflect a different mix of visits. Black physicians provide somewhat fewer office and inpatient visits but see twice as many patients in hospital emergency rooms and outpatient clinics. This high ER/clinic visit rate is consistent with the large public program caseloads of black physicians. (Physicians with large Medicaid and assigned practices make significantly more of these types of visits. See Tables 4-6 and 4-22.)

TABLE 9-3

WORK EFFORT AND CASELOAD PER WEEK BY PHYSICIAN RACE

	Physician Race	
	White	Black
Total Patient Care Hours	54.3	60.5
Total Visits	188.4	186.0
Office Visits	123.2	116.8
Inpatient Visits	50.7	47.1
ER/Clinic Visits	6.3	14.2
Operations	3.9	3.6
Nursing Home Visits	3.2	2.7
House Calls	1.2	1.7
Length of Office Visit(minutes)	20.3	22.4

9.4 Physician Earnings

We would expect net incomes to be lower for black physicians for several reasons. First, private demand for their services may be lower. This may occur because they have fewer credentials (e.g. less often board-certified) or because of racial discrimination (on the part of either patients or referring physicians). Second, black physician incomes may also be lower because of their extensive participation in the public market. (Of course, low private demand is probably the major reason for their entry into the Medicaid and Medicare assignment markets to begin with.) Table 9-4 shows that *black physicians do indeed earn less; net incomes are about 22 percent lower on average*. Because the black physician sample includes a disproportionate number of GPs (who tend to earn less), we adjusted their incomes and wages, using the procedure described earlier. This actually has the effect of widening the earnings gap; *specialty-adjusted incomes for black physicians are only 72 percent of those earned by white physicians*. Because black physicians work longer hours, adjustment of incomes for work effort lowers their net return even further. *Black physicians earn eight dollars, or 35 percent, less per hour worked (specialty-adjusted) than their white colleagues*.

Table 9-4 also presents the usual, Medicare prevailing, and Medicaid fees for a follow-up office visit. As black physicians charge the same usual fees as white physicians, the lower Medicaid fees (and to a smaller extent, the lower Medicare prevailing charges for assigned patients) they receive must contribute to their low incomes. White physicians receive even less from Medicaid (a factor undoubtedly in their lower participation rates), but because their Medicaid caseloads are so much smaller, their *average* revenues will still be higher. A black physician, for example, would receive an average of $10.63 for a follow-up office visit ($11.71*0.63 + $10.44*0.08 + $8.34*0.29), adjusting average fees for the private, Medicare assigned, and Medicaid shares of his practice. A white physician, on the other hand, would receive $11.21 on average ($11.76*0.81 + $10.43*0.07 + $7.97*0.12).* Black physicians thus would average 95 percent of what white physicians would because of differences in public program proportions and fees.

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*The Medicare percentage is for assigned patients only, taken from Table 9-2, e.g., (.549)(.147)=.08. This assumes physicians receive their usual fee for all nonassigned Medicare visits.

TABLE 9-4

PHYSICIAN EARNINGS BY PHYSICIAN RACE[a]

	Physician Race	
	White	Black
Net Income	$56,807	$44,187/40,897[b]
Hourly Wage	23.62	16.66/15.45[b]
Usual Fee, Follow-up Office Visit	11.76	11.71
Medicare Prevailing Charge	10.43	10.44
Medicaid Fee	7.97	8.34

[a] Incomes and fees are adjusted for geographic cost-of-living differences.

[b] Adjusted for white physician specialty mix.

TABLE 9-5

REDUCED FEES AND BAD DEBTS BY PHYSICIAN RACE

	Physician Race	
	White	Black
Reduce or Waive Fee (% of medically indigent patients)	7.1%	10.6%
Collection Ratio[a] (% of billings collected)		
96+ %	20.8	7.8
90-95 %	39.1	41.1
80-89 %	29.5	18.2
< 80 %	10.6	33.0

[a] Percentages sum to 100% by column.

But if black physicians net only five percent less per visit than white physicians, why are incomes 28 percent lower? The answer undoubtedly lies in the fees received from private (non-Medicaid/Medicare) patients. Physicians generally receive less than their usual fee, because of bad debts and reduced fees; if black physicians incur more losses (as seems likely, given the higher percent of their practice that is poor), then their usual fees may be overestimated relative to those of white physicians. Table 9-5 suggests that this is in fact the case. Black physicians are much more likely to reduce or waive their usual fee for indigent patients. More important (in terms of their impact on final transactions prices) are the bad debts incurred in black physicians' practices. While one-fifth of all white physicians report collection ratios exceeding 95 percent, only 7.8 percent of black physicians are able to collect that much of their total billings. Even more striking, one-third of all black physicians state they lose at least 20 cents on every dollar billed (collection ratios less than 80%). The comparable figure for white physicians is only 10.6 percent. Adjusting for nonpayment still leaves much of the earnings discrepancy unexplained, however.

9.5 Geographic Location

Previous work has shown that black physicians are located not in the areas with the largest black communities, but those where black incomes and population growth have been high (e.g. Gray, 1977). As can be seen in Table 9-6, the South has one-half of the black population, but only one-quarter of the black physicians. Compared with white physicians, black physicians are more likely to be located in the North Central part of the country and less likely to practice in the South and West. They are also less likely to practice in rural areas; only 5.5 percent of black physicians practice outside metropolitan areas, compared with 25.9 percent of white physicians.

9.6 Political Attitudes

Another explanation for the larger public program caseloads of black physicians could be more liberal socio-political attitudes. Previous work has shown that these attitudes do influence the Medicaid participation and Medicare assignment decisions, above and beyond traditional political attitudes (Sloan, Cromwell, Mitchell, 1978).

TABLE 9-6

GEOGRAPHIC LOCATION BY PHYSICIAN RACE
(percent distribution)

	Physician Race		Black Population[a]
	White	Black	
North East	28.6 %	28.0 %	18.4 %
North Central	20.0	34.2	20.7
South	33.5	25.0	52.7
West	17.0	12.8	8.2
Urban	74.1	94.5	81.3
Rural	25.9	5.5	18.7

[a] Source: Statistical Abstract of the United States, 1979. Table Nos. 21 and 37.

TABLE 9-7

PHYSICIAN POLITICAL ATTITUDES BY PHYSICIAN RACE (percent distribution)[a]

Attitudes by Physician Race	Strongly Agree	Agree Somewhat	Disagree Somewhat	Strongly Disagree
"It is the responsibility of society, through its government, to provide everyone with the best available medical care, whether he can afford it or not."				
White	19.1%	25.8%	22.0%	33.0%
Black	45.9	28.2	12.9	12.9
"There are too many controls on the medical profession that interfere with taking care of patients."				
White	60.3	21.4	14.4	3.9
Black	71.2	11.2	11.2	6.5

[a] Rows sum to 100%.

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